

SEDIMENT MANAGEMENT STANDARDS

CHAPTER 173-204 WAC

RESPONSIVENESS SUMMARY  
FOR ADOPTION OF CHAPTER 173-204 WAC  
SEDIMENT MANAGEMENT STANDARDS

PREPARED BY THE WASHINGTON  
DEPARTMENT OF ECOLOGY  
DECEMBER 1990

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## **I. CONCISE EXPLANATORY STATEMENT**

Ecology is proposing to adopt Sediment Management Standards, Chapter 173-204 WAC. The Sediment Management Standards (SMS) establish chemical and biological sediment quality standards for Puget Sound sediments and reserve sediment quality standards for other areas of Washington State. The rule also establishes statewide requirements for implementation of source control activities and authorization, maintenance, and closure of sediment impact zones, i.e., sediment dilution zones, and a contaminated sediment cleanup decision process to meet the sediment quality goals identified in the rule.

## **II. INTRODUCTION**

### **A. BACKGROUND AND PUBLIC INVOLVEMENT**

Areas of contaminated sediments and associated adverse effects have been identified in Washington State since the early 1980's. Contamination in sediments comes from a number of sources, including historic practices and ongoing point and nonpoint discharges. Rules currently in place that limit discharges to waters of the state are primarily concerned with water quality rather than sediment quality and therefore do not directly address the problems associated with sediment contamination. Since toxicants from the water column can concentrate in sediments, harmful sediment contamination can occur even when the water column is not seriously contaminated. Prior to the adoption of the 1987 Puget Sound Water Quality Management Plan (the Plan), the regulation of discharges, the management of dredging and disposal, and the identification and ranking of contaminated sediment sites for cleanup have all been hampered by the lack of coordinated goals and/or policies for the prevention of sediment contamination. The absence of any adopted sediment quality standards added to the difficulty in consistent protection of sediment quality.

In 1987, the Puget Sound Water Quality Management Plan (the Plan) was adopted by the Puget Sound Water Quality Authority. The Plan presents goals, strategies, and work elements for twelve program areas to improve and protect the quality of Puget Sound. In particular, the Municipal and Industrial Discharges Program and the Contaminated Sediments and Dredging Program address identification and management of contaminated sediments. These programs direct Ecology to develop Puget Sound sediment quality standards, source control requirements including discharge sediment dilution zones, and a contaminated sediment cleanup decision process.

In 1988, Ecology began developing the SMS. Four public workshops

were conducted to discuss preliminary drafts of the rule and in August 1988, an external advisory group, the Sediment Advisory Group, was formed to advise the department on key technical and policy issues relevant to the draft rule. The advisory group had representatives from business, environmental groups, tribes, local government, and state and federal agencies. The Sediment Advisory Group met frequently through February 1990, and produced a policy issues paper dated November 1989.

Through 1989, Ecology conducted the following activities:

- \* Developed over 15 contract reports on key technical issues;
- \* Developed a response to the U.S. Environmental Protection Agency Science Advisory Board report on their review of the Apparent Effects Threshold method (used by Ecology in developing sediment chemical criteria);
- \* Provided briefings of the Ecological Commission and Ecology's Science Advisory Board; and
- \* Developed the "December 1989 Interim Sediment Quality Evaluation Process" guidance document and established this process as Ecology policy.

In 1990, Ecology established the SMS Workgroup to discuss and develop key issues for source control and cleanup implementation requirements within the draft rule. The workgroup consisted of a balanced representation of environmental groups, tribes, ports, state and federal agencies, industries and municipalities. The workgroup provided formal recommendations to Ecology which were included with Ecology's responses in a policy paper.

## **B. PUBLIC REVIEW PROCESS**

The proposed rule was filed with the Office of the Code Reviser on September 18, 1990 and subsequently published in the October 3, 1990 Washington State Register as WSR 90-19-084. The formal comment period extended from October 3, through November 5, 1990.

Two public hearings were held on the proposed rule. Notice of these was sent to the Olympia offices of the United Press International and the Associated Press, and was placed in the Bellingham Herald and the Seattle Post-Intelligencer. Printed notice of the public comment period was directly mailed to over 1000 interested citizens, environmental organizations, and special interest groups.

Staff also informally discussed the proposed rule and related issues prior to and after the following hearings:

October 23, 1990

BellinghamFairhaven Public Library  
1117 12th Street

October 24, 1990  
Commission

Seattle

Port of Seattle

Chambers  
Pier 66, 2201 Alaskan Way

#### **C. SCHEDULED ADOPTION DATE**

The final SMS are scheduled for adoption by Ecology on January 23, 1991.

#### **D. FORMAT OF THE RESPONSIVENESS SUMMARY**

A list of individuals and organizations that commented on the proposed rule is provided in Part III. Part IV provides specific comments and Ecology responses separated into five parts. Part IV-A identifies oral comments on the proposed rule and environmental impact statement made by each speaker at the formal public hearings and provides Ecology's response to each comment. Part IV-B identifies written comments on the proposed rule that are general in nature and provides Ecology's response to each comment. Part IV-C identifies written comments received by Ecology that are specific to a particular section/subsection of the proposed rule and provides Ecology's response to each comment.

Part IV-D identifies written comments on the draft environmental impact statement and provides Ecology's response to each comment.

Part IV-E identifies written comments on the draft economic impact statement and provides Ecology's response to each comment.

### III. LIST OF INDIVIDUALS AND ORGANIZATIONS PROVIDING COMMENT

#### A. Oral Comment

John Servais  
Citizen  
1609 Mill Ave  
Bellingham, WA 98225

Jacqueline Anderson  
Concerned Southside Citizens  
1613 Wilson  
Bellingham, WA 98225

Mike MacKay  
Lummi Tribe  
Natural Resources  
2616 Kwina Road  
Bellingham, WA 98226

Konrad Liegel  
Preston, Thorgrimson,  
Shindler, Gates and Ellis on  
behalf of  
City of Tacoma, Atochem North  
America, Simpson  
Investment Company  
5400 Columbia Center  
701 5th Avenue  
Seattle, WA 98104

G. Patrick Romberg  
METRO  
821 2nd Avenue  
Seattle, WA 98072

Dr. M. Pat Wennekens  
399 Norman Street  
Sequim, WA 98382

Clay Patmont  
Hart Crowser  
1910 Fairview Avenue East  
Seattle, WA 98110

Carol Ready  
Tacoma-Pierce County Health  
Department  
3629 South "D" Street  
Tacoma, WA 98408

#### B. Written Comment

Dr. David W. Jamison  
Washington Department of  
Natural Resources  
Mail Stop EX-12  
Olympia, WA 98504

John L. Pitts  
Aquatic Farm Program Manager  
Department of Agriculture  
Mail Stop AX-41  
Olympia, WA 98504

Nancy McKay  
Acting Executive Director  
Puget Sound Water Quality  
Authority  
217 Pine Street

Robert S. Burd  
U.S. Environmental Protection  
Agency, Region 10  
1200 Sixth Avenue  
Seattle, WA 98101

Seattle, WA 98101

George W. Ploudre, P.E.  
Department Of The Army  
Seattle District  
Corps of Engineers  
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Seattle, WA 98124-2255

Eric Johnson  
Washington Public Ports  
Association  
1501 Capitol Way  
Olympia, WA 98507

Pat Petuchov  
Nooksack Indian Tribe  
P.O. Box 157  
Deming, WA 98244

Ruth A. Nelson  
UNIMAR International, Inc.  
1441 Northlake Way  
Seattle, WA 98103

Christopher H. Gibson  
Sea Farm Washington Inc.  
P.O. Box 2499  
Port Angeles, WA 98362

Daniel D. Syrdal  
Heller, Ehrman, White and  
McAuliffe  
6100 Columbia Center  
701 Fifth Avenue  
Seattle, WA 98104

D. J. Fogelquist  
Western States Petroleum  
Association  
2201 Sixth Avenue, Suite 1105  
Seattle, WA 98121

Richard D. Ford  
Preston, Thorgrimson,  
Shindler, Gates and Ellis on  
behalf of  
City of Tacoma, Atochem North  
America, Simpson  
Investment Company

W. Arthur Noble  
Washington Environmental  
Council  
5200 University Way N.E.,  
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Seattle, WA 98105

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Monroe Toxicology  
Professionals  
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142  
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G. Patrick Romberg  
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Seattle, WA 98072

Dan R. Van Slyke  
Paradise Bay Seafarms  
213 Decatur Street  
Port Townsend, WA 98368

Morten Blomso  
Doug Brickley  
Global Aqua USA  
355 Ericksen Ave.  
Suite 421  
Bainbridge Island, WA 98110

Thomas L. Aldrich  
ASARCO Inc.  
P.O. Box 1677  
Tacoma, WA 98401

Parametrix, Inc.  
for ASARCO, Inc.  
13020 Northup Way  
Bellevue, WA 98005

Dr. Philip B. Dorn  
Dr. Charles L. Meyer  
Shell Development Company  
for Western States Petroleum  
Association  
P.O. Box 1380  
Houston, Texas 77251

5400 Columbia Center  
701 5th Avenue  
Seattle, WA 98104

#### IV. COMMENTS AND RESPONSES

##### Rule Comments

For the purpose of this responsiveness summary, Ecology has included responses to oral and written comments made on the proposed rule, Chapter 173-204 WAC, Sediment Management Standards.

Oral comments on the rule are organized in Part A. Written comments on the rule are organized by two methods. Written comments that are general in nature or nonspecific to a section of the rule are addressed in Part B. General Written Comments. Written comments referencing specific sections within the proposed SMS are included under Part C.

Where Ecology decided to make a revision to the proposed rule based on a comment, the intended revision appears in **bold** type within Ecology's response.

##### Environmental Impact Statement / Economic Impact Statement Comments

Oral comments on the draft environmental impact statement are included in Part A. Ecology has included responses to written comments on the draft environmental impact statement in Part D. Written comments on the draft economic impact statement and Ecology's responses may be found in Part E.



## **A. ORAL COMMENTS**

### **John Servais**

#### Comment

**A-1.** Mr. Servais commented that citizen participation in the Bellingham hearing was hindered by inappropriately limited public notice. Experts who could have contributed technical information relevant to Bellingham Bay were not provided sufficient notice to arrange for participation. And there was insufficient time for the public to prepare appropriate comments. Mailings of the meeting notice to dischargers does not provide for balanced and fair public involvement.

#### Response

Ecology's public notice procedures to receive comment on the proposed rule and its environmental impacts consisted of publication of the proposed rule, hearing locations, and comment period in the Washington State Register, and mailout of more than 1000 notices to persons or groups who have expressed an interest in the rule in and around Puget Sound. The public notice mailout was completed on or before October 11, 1990 and included not only dischargers, but also ports, cities, agencies, environmental groups, tribes, and individual citizens. Interested citizens still have the opportunity to provide Ecology written comments on the rule until November 5, 1990.

Although these procedures met the public notice requirements of law, Ecology regrets that citizens interested in Bellingham Bay sediment quality issues were not included in the notice mailout. To improve our public involvement process in the future, Ecology will place all Puget Sound Urban Bay Action Program Citizen Advisory Committees (CAC) on our mailing list for sediment issues.

As Part III of this Responsiveness Summary indicates, Ecology has conducted an extensive three year public involvement process to identify and discuss key technical and policy issues pertinent to the rule with key interest groups and the public. After rule adoption, Ecology will remain committed to improved public involvement in the implementation of the rule. Initially, Ecology has planned presentations to all Urban Bay Action Program Citizen Advisory Committees (CAC), beginning with the Bellingham Bay CAC in early 1991, to discuss use of the SMS in establishment and implementation of source control and cleanup activities to protect sediment quality. Ecology believes the continued involvement and cooperation by citizens, dischargers, ports, public interest groups, tribes, and state and federal agencies is absolutely necessary for the successful implementation of the SMS.

Comment

**A-2.** Mr. Servais commented that the Port of Bellingham is currently testing Whatcom Waterway and has plans to dredge the waterway in the next couple years. Mr. Servais stated his concern about what chemicals these sediments contain and where they will be disposed of. Mr. Servais asked whether the proposed standards address these issues and are they strict enough?

Response

The proposed SMS do not directly address management of dredged material in Puget Sound. Currently, dredging and disposal decisions in Puget Sound are administered routinely under the Puget Sound Dredged Disposal Analysis (PSDDA) via permit authorities established under the federal Clean Water Act. Any Whatcom Waterway dredging proposal must be reviewed under the PSDDA for authorization of any unconfined, open-water disposal actions. This review will include chemical contaminant concentrations present in sediments proposed for dredging and disposal. Please contact Mr. Hiram Arden of the U.S. Army Corps of Engineers concerning the current permit application status for this project proposal. Mr. Arden can be reached at (206) 764-3401.

**Jacqueline Anderson**

Comment

**A-3.** Ms. Wilson commented that the mailing of the notice for this hearing did not reach the interested citizens. Who was the notice mailed to? Ms. Wilson stated that active citizen participants in the cleanup studies in Bellingham Bay (e.g., on the Urban Bay Team advisory committee) have previously expressed their concerns regarding sediment contamination, yet were not given sufficient notice to prepare comments for the hearing.

Response

Please see the response to comment A-1 above.

Comment

**A-4.** Ms. Wilson asked how the process of adopting the SMS and the public review of the EIS relate to ongoing efforts to clean up Bellingham Bay?

### Response

Although the proposed SMS do not directly relate to any specific contaminated sediment area in Puget Sound, the rule when adopted will provide key sediment contamination criteria and source control and cleanup procedures needed to implement contaminated sediment cleanup activities in Bellingham Bay and throughout Puget Sound. The related environmental impact statement (EIS) evaluates four alternatives for:

- \* Establishing the maximum degree of sediment contamination allowed from ongoing discharge sources, i.e., the sediment impact zone maximum (SIZ<sub>max</sub>);
- \* Establishing the maximum degree of contamination allowed before a contaminated sediment site cleanup is required, i.e., the cleanup screening level (CSL); and
- \* Establishing the maximum degree of sediment contamination allowed to be left in place after active cleanup, i.e., a minimum cleanup level (MCUL).

Public review of the EIS may relate to specific contaminated sediment cleanup issues in Bellingham Bay by comparison of the EIS alternatives with known Bellingham Bay sediment chemical and biological effects data. Additionally, public review of the EIS may relate to Bellingham Bay cleanup efforts through evaluation of the EIS alternatives and their associated impacts and selection of a preferred alternative for protection of Bellingham Bay resources.

### **Mike MacKay**

#### Comment

**A-5.** Mr. MacKay asked what are the implications of the rule and EIS alternatives to Bellingham Bay resources and cleanup activities?

#### Response

Please see the response to comment A-4 above.

#### Comment

**A-6.** Mr. MacKay stated that since the SMS will eventually be applied to cleanup actions in Bellingham Bay, local groups deserve an adequate opportunity to understand and participate in the review of the standards. Mr. MacKay asked that an additional

hearing be scheduled to allow local people to be involved in this process.

Response

Given the considerable public involvement effort to-date (see Part III of the Responsiveness Summary), the interests of the public to begin site specific source control and contaminated sediment cleanup actions in Puget Sound would best be served now by adoption of the rule as proposed in January 1991. Therefore, Ecology decided not to conduct another public hearing on the adoption of the SMS. However, Ecology agrees with the need to provide additional opportunities to increase understanding of the technical methods, policies and procedures within the SMS for Bellingham citizens and other interested parties statewide. To this end, Ecology will be conducting additional information and education meetings for interested groups statewide on the rule and its proposed implementation. These meetings will begin with the Bellingham Bay Urban Bay Action Program Citizen Advisory Committee in early 1991.

Comment

**A-7.** Mr. MacKay asked will there be an opportunity to revise the rule requirements as we learn more about sediment contamination efforts? Mr. MacKay also asked will there be a periodic review of the preferred alternative standards contained in the rule?

Response

In Section 130 of the proposed SMS, Ecology identifies its intent to conduct an annual review of the rule, and to modify the rule every three years, or as necessary. Ecology expects that new data and/or scientific information will necessitate periodic review and modification of the rule's requirements. Ecology will accept any public comment concerning the need for modification of the rule to fully protect biological resources and human health using methods and criteria that reflect the latest scientific knowledge. Additionally, Section 130 identifies that modification of the SMS must follow legal procedures stipulated by the Administrative Procedure Act, Chapter 34.05 RCW. Public review of proposed modifications to the rule will necessarily meet the public notice procedures of the Administrative Procedure Act at a minimum. Also, Ecology will provide mailing and public notice to interested parties concerning proposed modifications to the rule.

**Konrad Liegel**

Comment

**A-8.** Mr. Liegel expressed appreciation for Ecology convening the SMS Workgroup to address and try to resolve rule policy and language issues. The final SMS were greatly improved through this workgroup process. The proposed rule shows Ecology's willingness to listen to concerns raised by the regulated community and the public, and to incorporate needed revisions. As a result, the proposed rule is easier to understand and more workable in practice. Mr. Liegel also expressed concern about the proposed rule's impacts on the regulated community. Mr. Liegel commented that Ecology's job is not yet completed and urged Ecology to reevaluate portions of the rule to ensure that the rule is clear and unambiguous and will result in environmental benefits that justify the significant environmental costs to the regulated community.

#### Response

Ecology acknowledges Mr. Liegel's appreciation of the sediment workgroup process. Further evaluation and improvement of the rule occurred during the comment period prior to adoption, and will continue after adoption given the administrative policy contained within the rule to review the rule annually with modifications made every three years or as necessary.

#### Comment

**A-9.** Mr. Liegel commented that in view of the experimental nature of the sediment management program, and its significant costs, Ecology should reevaluate specific portions of the rule before final promulgation to ensure that its environmental benefits are fully realized and outweigh its economic costs.

#### Response

Ecology acknowledges that management of sediment quality is a new and complex field, but considers the term "experimental" a misnomer for the majority of the sediment management program criteria and requirements. As Ecology attempts to equitably assign responsibility for source control and cleanup actions to prevent and/or cleanup sediment contamination, use of innovative technologies, such as modeling and trend analysis are proposed in conjunction with providing the necessary flexibility to fairly interpret the results using best professional judgment. Ecology remains committed to a comprehensive consideration and evaluation of the rule to improve clarity, and enhance environmental benefits while minimizing economic costs prior to and after adoption.

#### Comment

**A-10.** Mr. Liegel commented that the final rule should allow more flexibility in setting cleanup levels and phasing in compliance with sediment impact zone requirements.

Response

Ecology supports, and the proposed rule currently reflects, the results of the SMS Workgroup discussions on enhanced flexibility in setting the cleanup standard at a contaminated sediment cleanup site. The rule currently allows consideration of time (i.e., natural recovery), cost, net environmental impact, and technical feasibility to establish a site cleanup standard within the range defined by the sediment quality standards and the minimum cleanup level (MCUL). Ecology believes constraining the upper limit of contamination allowed to be left in place after active cleanup (i.e., the MCUL) is necessary to provide an underlying assurance of acceptable environmental and human health protection from cleanup actions. The rule currently allows for an "interim compliance" status after application for a SIZ and before a SIZ authorization is issued. It also allows for SIZ authorizations to include "compliance time frames." While there are statutory constraints on phasing of SIZ implementation, some degree of phasing will occur as agency resources are dedicated to high priority permits that are up for renewal.

Comment

**A-11.** Mr. Liegel suggested that Ecology not specify a minimum cleanup level in the final rule. Mr. Liegel commented that not including a specific cleanup level in the final rule is appropriate given the site specific nature and significant cost of individual cleanup actions, the lack of disposal sites, the environmental impacts of cleanup methodologies, and the fact that unlike dredging actions, the cleanup action decision involves not only where you put the sediment but also how much sediment you clean up. If any cleanup level is chosen, it should be the highest AET (Apparent Effects Threshold) for the reasons mentioned.

Response

Ecology concurs with the consensus recommendation of the SMS Workgroup that a minimum cleanup level should be stipulated within the rule. Ecology believes the proposed rule provides adequate flexibility for consideration of multiple factors in selection of a contaminated sediment site cleanup standard and site-specific cleanup action. While consideration of these factors is necessary to successful implementation, cleanup actions must ensure an acceptable level of environmental and human health protection.

Ecology's selection of the minimum cleanup level proposed within the rule is based on the evaluation of alternatives included within the related environmental impact statement (EIS).

Comment

**A-12.** Mr. Liegel commented that ongoing validation and refinement of the proposed rule should take place before Ecology requires a discharger to apply for a sediment impact zone or finalizes the list of contaminated sediment sites. Mr. Liegel also suggested that Ecology make use of the Scientific Advisory Board in the annual and triennial review of the SMS.

Response

Ecology agrees with the need to further refine and verify the sediment impact zone models and site identification and ranking methods, but believes this work will occur over a number of years and is not necessary to complete prior to adoption and application of the rule. Refinement and verification work tasks can and should be ongoing and related to continuing development and broad-based implementation of sediment source control and cleanup programs. For some activities, phased implementation may be necessary based in part on the schedule and results of verification studies and the development of implementation guidance documents. The ranking system will be field verified before developing an initial list of sites. And the site list will be screened to ensure consistency with existing information and professional judgment. As experience is gained, revisions to the codified decision process will occur. Ecology currently proposes to use the Ecology Science Advisory Board for review of technical issues pertinent to establishment of cleanup standards for sediments under authority of the Model Toxics Control Act, Chapter 70.105D, as defined by that enabling legislation.

Comment

**A-13.** Mr. Liegel commented that the final rule should clarify that it was not developed with the intent to define damage to natural resources. The AET method is unable to link perceived impacts with chemical concentration levels, and therefore is an inappropriate method for assessing the damage to natural resources.

Response

After careful consideration, Ecology will not include language regarding natural resource damage assessment in the rule. Ecology acknowledges that the SMS were not developed with the intent to define "injury", "damage", or "natural resource". However, future

trustee programs or a court of law may review the rule for its applicability to these definitions and the natural resource damage assessment process in general. Ecology does not want to preclude the rule's utility to future agency programs or future case law interpretation.

#### Comment

**A-14.** Mr. Liegel commented that the final rule should specify the level of monitoring that would be required under different circumstances. As the monitoring requirements would pose the greatest initial cost stemming from the rule, the lack of any specificity in the rule is troubling.

#### Response

Ecology believes the development of sediment monitoring guidelines are a high priority implementation activity, but that the multiple scenarios necessary for monitoring consideration preclude their inclusion in the SMS. The rule provides narrative data requirements for application for a sediment impact zone authorization. The rule requirements reference Ecology's Permit Writer's Manual which will provide agency permit writers with guidance on monitoring requirements. The Permit Writer's Manual will address when and where monitoring is required, types of parameters and intensity of monitoring, and data interpretation. The monitoring guidelines will also discuss where monitoring may not be needed and when monitoring frequency and the number of parameters and types of tests may be reduced.

#### Comment

**A-15.** Mr. Liegel commented that the final rule should be completely unambiguous in who the rule applies to, when it applies, and what happens if a party fails to comply with its requirements.

He noted that although Ecology removed much of the rule ambiguity during the workgroup process, the proposed rule remains unclear as to when a discharger must apply for a sediment impact zone. The proposed rule is also unclear as to what sanctions if any, may be imposed on a discharger, if the discharger is required to apply for a sediment impact zone, but fails to do so.

#### Response

The proposed rule specifically states in Section 415 (2)(b) the conditions requiring application for a sediment impact zone. These conditions include upon written notification by the department or after independent identification of the need for a sediment impact zone by the discharger.



Although Ecology supports regulatory clarity, the rule is applicable to a wide variety of implementation scenarios and use via multiple administrative authorities. For example, consequences of failure to comply can range from reminder letters to monetary penalties under different administrative authorities.

Removal of such flexibility limits the implementation of the SMS by the department, interferes with application of the department's best professional judgment authority under state and federal water quality laws, and is not in the best interest of the environment, the regulated community or the public.

Enforcement of the proposed standards, similar to current enforcement of the Water Quality Standards, will primarily be through already defined enforcement and penalty mechanisms contained in the Water Pollution Control Act (WPCA), Chapter 90.48 RCW, and the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

**The rule will be modified to include a policy statement in section 130 that identifies enforcement of the SMS shall be taken as necessary pursuant to the pertinent authorizing legislation.**

#### **G. Patrick Romberg**

##### Comment

**A-16.** Mr. Romberg commented that Metro supports the development of sediment standards to manage sediments in Puget Sound. Metro is interested in good, sound standards that will allow sediment management to be done in a reasonable way for the regulated community. Metro agrees with Ecology in that some areas of the Sound will not be able to meet the "no effects" standard and therefore we will need to authorize exceedances of this standard.

##### Response

Ecology acknowledges Metro's support of the need for sediment management standards.

##### Comment

**A-17.** Mr. Romberg commented that Ecology needs to include more flexibility in the establishment of sediment impact zones and the minimum cleanup level, e.g., flexibility beyond the single bioassay test exceedance allowed by the Puget Sound Dredged Disposal Analysis. Risk assessment should be allowed as in terrestrial investigations, to set sediment standards and cleanup levels.

### Response

Ecology believes sufficient flexibility for implementation of sediment impact zones (SIZ) and the minimum cleanup level (MCUL) has been incorporated into the proposed SMS via three major procedural requirements. These requirements are used for the purpose of establishing and defining compliance with the sediment impact zone maximum level (SIZ<sub>max</sub>) and the minimum cleanup level. First, both SIZ's and the MCUL are established as points of compliance at year 10 of a discharge or 10 years after cleanup, respectively. Providing for incorporation of a 10 year compliance period allows consideration of natural recovery to mitigate the impacts of a discharge or the impacts of contaminant levels left in-place after cleanup. Second, when defining compliance with the SIZ<sub>max</sub> and the MCUL, the proposed rule allows use of contaminant averaging to represent the level of chemical contaminant represented by direct sediment sampling. Contaminant averaging tends to lower the chemical concentration selected to represent a single station where sediment was sampled. It also reduces the influence of anomalous station data. Finally, the SIZ<sub>max</sub> and the MCUL levels are established via 47 chemical limits and/or multiple biological endpoints which define an effects level above (less stringent) the sediment quality standards. For example, the SIZ<sub>max</sub> and MCUL biological endpoints are exceeded when any two biological tests exceed the biological test interpretations (one test exceedance defines the sediment quality standards biological endpoint).

The SMS allow the use of risk assessment to identify a cleanup level within the range defined by the sediment quality standards and the minimum cleanup level. Further, risk assessment and risk management are considered the likely approach to establishing sediment criteria for the protection of human health, an effort Ecology plans to conduct in 1991. However, Ecology did not use a quantitative risk assessment to establish ecological protection "standards", i.e., the sediment quality standards or the minimum cleanup level. Ecological risk assessment requires quantitation of many relationships for which we have little or no data. The use of assumptions to compensate for these data gaps introduces a high degree of uncertainty thus exposing the standard itself to criticism. Additionally, we do not yet have accepted models or interpretation standards for ecological risk assessments. The chemical and biological tests contained in the rule provide an appropriate assessment of the ecological effects of sediment contamination.

### Comment

**A-18.** Mr. Romberg commented that Ecology needs to verify the

sediment impact zone approach and the models used for these predictions. The WASP 4 model is very complex and requires considerable data to achieve accurate predictions. It is important that Ecology verify and gain experience in this methodology.

#### Response

Ecology agrees with the need to further refine and verify the sediment impact zone models and site identification and ranking methods prior to their implementation. Improvements to the technical methods in the rule is ongoing and will continue after rule adoption.

#### Comment

**A-19.** Mr. Romberg commented that Ecology needs a phased approach for implementing the standards, especially for the sediment impact zones and minimum cleanup levels.

#### Response

While there are statutory constraints on phasing of SIZ implementation, some degree of phasing will occur as agency resources are dedicated to high priority permits that are up for renewal. Phasing of cleanup decisions will also occur as a result of the list of priority cleanup sites to be developed per the rule.

#### Comment

**A-20.** Ecology needs more definition of the monitoring requirements for sediment impact zones. Per the environmental impact statement, the costs of monitoring these zones could be very high. Since Metro has 13 marine combined sewer overflows, it could expect to pay 2 to 3 million dollars over a 5 year period in monitoring costs alone. These costs may not be valuable.

#### Response

Ecology believes the development of sediment monitoring guidelines are a high priority implementation activity, but that the multiple scenarios necessary for monitoring consideration preclude their inclusion in the SMS. The rule provides narrative data requirements for application for a sediment impact zone authorization. The rule requirements reference Ecology's Permit Writer's Manual which will provide agency permit writers with guidance on monitoring requirements. The Permit Writer's Manual will address when and where monitoring is required, types of

parameters and intensity of monitoring, and data interpretation. The monitoring guidelines will also discuss where monitoring may not be needed and when monitoring frequency and the number of parameters and types of tests may be reduced.

When considering the costs of monitoring, Ecology believes it is necessary to generally view these costs as "preventative" against much higher costs associated with contaminated sediment cleanup actions which may be required in cases where source discharge monitoring did not occur and impacts or potential impacts to environmental resources and human health resulted.

#### Comment

**A-21.** Mr. Romberg commented that the SMS need to be implemented for the first five years by the Sediment Management Unit within Ecology that was involved in their development. This is critical because the sediment impact zone and minimum cleanup level determinations are far too complex for each permit writer to address. Ecology acknowledged the need for validating the approaches, and this needs to be done through the group that developed the standards framework (the Sediment Management Unit).

#### Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The key work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key features of implementation and rule interpretation will be addressed by the Sediment Management Unit.

Additionally, as a result of the SMS Workgroup, Ecology has committed to formation of an implementation committee to review the department's sediment impact zone implementation guidance documents and implementation activities for source control and cleanup activities mandated in the proposed rule. The implementation committee should be an excellent gauge on the consistent application of the SMS.

#### Comment

**A-22.** Mr. Romberg commented that there needs to be an open dialogue between an applicant for a sediment impact zone authorization and the Ecology permit writer responsible for the associated discharge permit before the authorization is drafted,

to establish appropriate levels of contamination within the sediment impact zone.

Response

The communication process currently used by Ecology permit writers is described in the department's Permit Writer's Manual. It was developed with the assistance of both an internal and external advisory group. This process expressly encourages early communication between the permit writer and permittee to ensure that the draft permits are factually correct. However, to ensure equal public access to permit decisions, the process does not provide for communication on permit conditions until after the draft permit is issued to interested parties. Ecology agrees that improvements to the current communication process need to be developed between permittees, the public, and Ecology. The process contained in the Manual is considered to be an interim process pending future refinement. Ecology's Water Quality Program is currently responsible for improvements to the permit communication process. Revised guidance in the Permit Writer's Manual is scheduled for the end of 1991.

Comment

**A-23.** Mr. Romberg commented that Ecology should set limits for the use of the SMS for resource damage assessment and that specific language be included within the rule.

Response

After careful consideration, Ecology will not include language regarding natural resource damage assessment in the rule. Ecology acknowledges that the SMS were not developed with the intent to define "injury", "damage", or "natural resource". However, future trustee programs or a court of law may review the rule for its applicability to these definitions and the natural resource damage assessment process in general. Ecology does not want to preclude the rule's utility to future agency programs or future case law interpretation.

**Dr. M. Pat Wennekens**

Comment

**A-24.** Dr. Wennekens commented that the interagency, public and industry participation in the "behind the scenes" work leading to development of the rule was very useful in bringing forth a common sense concerning sediment pollution issues. However, despite all the work, what does the SMS rule really do to protect and cleanup

Puget Sound?

Response

Ecology acknowledges Mr. Wennekens support of the rule development public process. The SMS provide a "no adverse effects" long term sediment quality goal in the form of the sediment quality standards chemical and biological criteria, and technical, policy and procedural guidance to implement source control and cleanup activities to meet the sediment quality goal. Prior to development of the SMS, sediment management programs lacked definitive sediment quality protection criteria to define action levels for implementation of source control and cleanup programs.

Comment

**A-25.** Dr. Wennekens commented that because the SMS focus on in-place deposited marine sediment, the standards cannot be directly compared to the quality of discharges to Puget Sound and therefore source control actions based on the proposed rule will be ineffective. Because deposited marine sediment has fairly long hydrogeological and hydrochemical history, it may represent what is currently causing damage, but cannot be compared to discharges entering Puget Sound.

Response

Ecology acknowledges that due to the scientific method used, the sediment quality standards chemical and biological criteria only apply to settled sediment. The goal of the rule is to control the quality of discharges to Puget Sound to eliminate impacts to sediment quality and resultant adverse environmental affects and threats to human health. The key to protecting sediment quality is to understand the relationship between discharge quality and resultant impacts to sediment quality. The rule not only includes the sediment quality standards, but also several new technical tools which may be used to define the relationship between source discharge quality and sediment quality. Ecology believes there will be many cases throughout Puget Sound where these tools will clearly demonstrate a link between sediment quality and one or more discharges. In such cases, effective source control actions can take place.

Comment

**A-26.** Dr. Wennekens commented that language within element P-2 of the Municipal and Industrial Discharges Program in the Puget Sound Water Quality Management Plan i.e., " The sediment standards will establish the levels of sediment contamination that are acceptable

throughout the Sound over the long term" is inappropriate for use as the objective of the proposed SMS. The main objective of the rule should be to restore, maintain, and protect the environment per the context of the federal Clean Water Act.

#### Response

Ecology believes the proposed SMS meet the goals of both the Puget Sound Water Quality Management Plan (the Plan) and the federal Clean Water Act. Because Ecology received comments similar to this early in the rule development process, the scope of the rule was expanded to incorporate source control and cleanup objectives enabling the rule to meet the overall policy mandates of the federal Clean Water Act. This expansion of the rule also incorporates the goals and objectives of other elements of the Puget Sound Water Quality Management Plan, i.e, elements P-2, P-3 and S-7. The sediment quality standards (element P-2 of the Plan) within the rule have been developed consistent with the approach used for other environmental media (e.g., surface water quality standards) and identify the minimum conditions needed to protect the currently designated beneficial uses of Puget Sound. Also, inclusion of an antidegradation policy within the rule provides for protection of "pristine" areas that are less contaminated than the applicable sediment quality standards. The sediment source control (element P-3 of the Plan) and cleanup standards (element S-7 of the Plan) within the rule were developed primarily to maintain (prevent) and restore (clean up) sediment quality, respectively.

#### Comment

**A-27.** Dr. Wennekens commented that the proposed rule must comply with the environmental protection goal stated in the Clean Water Act, Section 303(c)(ii). Dr. Wennekens also commented that the antidegradation policy within the SMS should provide no exceptions for overriding consideration of the public which may allow sediment pollution to increase to "acceptable levels." Dr. Wennekens also stated that because the term "best management practices" is used within the antidegradation policy, the rule should provide a definition to ensure consistency with the Clean Water Act definition of the term.

#### Response

The proposed SMS have been developed consistent with the federal Clean Water Act and the approach used for other environmental media (e.g., surface water quality standards). The SMS identify the minimum conditions needed to protect the currently designated beneficial uses of the Sound. Provision for exceptions to the antidegradation policy are enabled in the Clean Water Act for

"social and economic reasons." Ecology believes inclusion of an exception to the antidegradation policy for overriding consideration of the public interest is consistent with the requirements of the Clean Water Act. Of course, this acknowledges that such exceptions are specifically limited to levels that are still protective of beneficial uses. **Ecology will modify the antidegradation policy within the SMS to clarify that the exceptions are specifically required to protect all designated beneficial uses. In addition, Ecology will include definitions for "beneficial uses" and "best management practices" that are consistent with the definition in the federal Clean Water Act.**

#### Comment

**A-28.** Dr. Wennekens commented that the sediment impact zone process in the rule ignores consideration of particle-bound pollution, i.e., contaminants attached to fine particulates. He commented that addressing settled sediment only allows for consideration of "physical pollution" from coarser sand and gravel particles. Dr. Wennekens asked how can the rule protect the quality of sediments without regulating particulates suspended in the water column or effluents discharged to Puget Sound? Ecology needs to reevaluate the exclusion of fine particulates from the rule in order to ensure effective source control.

#### Response

Ecology agrees that for sediment source control efforts, it is important to address both the suspended particulate and dissolved portions of discharges which may ultimately affect settled sediment quality in the receiving water. Although the scientific methodology used to identify the sediment quality standards limit their application to just settled sediments, the SMS do not ignore consideration of particle-bound contaminants. The proposed source control standards focus on demonstrating a link between the effluent quality of a discharge and the quality of the receiving water settled sediments. These tools include the use of effluent quality and receiving-water column information, (including the quality of particulates suspended in both) to conduct modeled or empirical demonstrations of the effect a particular discharge may have on receiving-water sediment quality. Though Ecology is not proposing standards for effluent quality or receiving-water suspended solids due to technical limitations, we clearly recognize their importance to protection of sediment quality within the rule. The rule proposes use of best available scientific methodology to address this technical issue, and the source control standards will provide the means to effectively protect sediment quality.



## Clay Patmont

### Comment

**A-29.** Mr. Patmont commented that he applauded Ecology for development of the sediment standards in that they focus on risk more so than other rules. Though additional emphasis on risk assessment could be provided, efforts made so far on risk assessment are very strong.

### Response

Ecology acknowledges this comment and notes that human health criteria development work planned for 1991 will continue to evaluate the usefulness of risk assessment in meeting the sediment quality protection goals of the SMS.

### Comment

**A-30.** Mr. Patmont commented that inclusion of the sediment recovery zone process within the rule is in the public interest. It recognizes a common, natural event with sediments.

### Response

Ecology agrees and acknowledges Mr. Patmont's support of sediment recovery zones.

### Comment

**A-31.** Mr. Patmont commented that the central headquarters staff, not individual project managers, should interpret key requirements of the SMS to avoid inequitable implementation from application of the rule to different cleanup sites. For example, interpreting the definition of "surface sediment" to determine the depth of sampling at cleanup sites can vary widely.

### Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The key work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key issues of implementation and rule interpretation will be directed to the Sediment Management Unit.

Additionally, as a result of the SMS Workgroup, Ecology has committed to formation of an implementation committee to review the department's sediment impact zone implementation guidance documents and implementation activities for source control and cleanup activities mandated in the proposed rule. The implementation committee should be an excellent gauge on the consistent application of the SMS.

Comment

**A-32.** Mr. Patmont commented Ecology should change the rule to identify the point of compliance for sediment impact zones and cleanup activities using the "probabilistic" point of compliance language similar to that in the Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC.

Response

The rule does not constrain the methods used to define the boundary of a SIZ or a sediment cleanup site.

Comment

**A-33.** Mr. Patmont commented that the rule should not limit bioassay response in acceptable reference sediments to a predetermined value, especially where the reference sediment meets chemical concentration requirements. The rule should instead allow use of a site-specific response noted in a reference sediment sample used for comparison to the test sediment bioassay results.

Response

Ecology's current approach for limitations on reference area performance is based primarily on the recent direction of the United States Environmental Protection Agency Science Advisory Board (SAB) Sediment Criteria Subcommittee. The SAB's report "Evaluation of the Apparent Effects Threshold (AET) Approach for Assessing Sediment Quality" (July 1989) states: "The Subcommittee recommends that criteria for selecting reference sites be formalized. The selection/rejection criteria need to be clearly defined and the rationale for their choice explained."

Specific "clean" reference area selection/rejection criteria are needed to ensure regulatory consistency, and to preclude improper designation of contaminated sediments via the SMS using comparisons to contaminated "reference area sediments" with high chemical concentration or biological effects levels.

Ecology is currently working to further the recommendations of the

SAB concerning identification of acceptable reference sediment locations and limitations for chemical concentration levels and biological response. The biological response levels for the acute amphipod test (*Rhepoxinius abronius*) within the SMS have been established based on a statistical evaluation of natural variability for the response of this animal in reference areas used to-date. Ecology plans to identify reference area locations and reference sediment performance standards for future incorporation into the SMS.

#### Comment

**A-34.** Mr. Patmont commented that the rule should not adopt a specific numeric value for the minimum cleanup level, but rather allow determination of the minimum cleanup level via a site specific risk assessment. Mr. Patmont noted his experience has demonstrated that the proposed minimum cleanup level values within the rule may be either over or underprotective of site risk, depending on the specific resource populations present in various microenvironments in Puget Sound.

#### Response

The SMS allow the use of risk assessment to identify a cleanup level within the range defined by the sediment quality standards and the minimum cleanup level. Further, risk assessment and risk management are considered the likely approach to establishing sediment criteria for the protection of human health, an effort Ecology plans to conduct in 1991. However, Ecology did not use a quantitative risk assessment to establish ecological protection "standards", i.e., the sediment quality standards or the minimum cleanup level. Ecological risk assessment requires quantitation of many relationships for which we have little or no data. The use of assumptions to compensate for these data gaps introduces a high degree of uncertainty thus exposing the standard itself to criticism. Additionally, we do not yet have accepted models or interpretation standards for ecological risk assessments. The chemical and biological tests contained in the rule provide an appropriate assessment of the ecological effects of sediment contamination.

#### **Carol Ready**

#### Comment

**A-35.** Ms. Ready asked if Ecology will be adopting standards for "problem waste" within the proposed rule or the Minimum Functional Standards For Solid Waste Handling, Chapter 173-304 WAC to enable the local health departments to determine proper disposal methods

for contaminated sediments.

#### Response

Ecology is currently developing a new and separate "Dredged Material Management Standards" rule that will replace the sediments portion, i.e., the "problem waste" section currently "reserved" in the Minimum Functional Standards for Solid Waste Handling, Chapter 173-304 WAC. The Dredged Material Management Standards will include the current criteria and procedures for open water disposal of relatively clean sediments as developed by the Puget Sound Dredged Disposal Analysis. It will also adopt confined disposal standards for dredged material unsuitable for unconfined, open-water disposal. The confined disposal standards part of the Dredged Material Management Standards will specify requirements for confined upland, nearshore, and aquatic dredged material disposal operations, including dredging, transport, site design and monitoring provisions. The Dredged Material Management Standards is currently scheduled for adoption in 1991.

In addition to the new Dredged Material Management Standards, a memorandum of understanding (MOU) is being developed that will formalize the coordination between Ecology and local health districts in the permit process for upland disposal. The MOU will call for mutual participation by Ecology and local health officials in the permit review process. Local authority over upland disposal decisionmaking will remain unchanged from existing procedures authorized under current solid waste law, Chapter 70.95 RCW; Ecology will provide technical review assistance and recommendations according to the agreements made with each health department or district.

The proposed SMS address the quality of sediments in water, and are generally applicable to dredging and dredged material disposal in water. However, specific requirements are deferred to other programs or rules (see section 173-204-410(6) of the proposed SMS).

## **B. WRITTEN COMMENTS -GENERAL**

**Dr. David Jamison**

### Comment

**B-1.** "In general the Standards are well done and carefully thought out. I agree with the basic process, concepts, and technical basis for the Standards. However I would note that there will be changes to the numbers and procedures as we all learn more about the implementation of the regulation in the future. Ecology should not make changes in isolation but rather should continue with an implementation committee. Such a committee would ensure that all points of view are heard prior to implementation of any change."

### Response

Ecology acknowledges the Department of Natural Resource's agreement with the process, concepts and technical basis of the SMS. Ecology acknowledges that changes to the adopted rule will likely be necessary in the future as new information becomes available. The SMS include provisions for routine review and modification of the rule via the requirements of the Administrative Procedure Act, Chapter 34.05 RCW. Ecology has also recognized that an implementation committee would enhance the development of implementation guidance documents and activities for the SMS. Ecology currently plans to organize an implementation committee in the first half of 1991.

**John L. Pitts**

### Comment

**B-2.** "...I support the concept you have proposed, but have questions regarding the latitude which will be given to biological impacts and sediment impact zones. The culture of finfish in net pens in marine waters, as practiced in this state for twenty years, does at times, result in loss of certain benthic species in a localized zone under and at the periphery of the net pens. Since these operations do not discharge toxicants or heavy metals, and since any impact is transient and disappears with removal of the facility, I believe special consideration should be made for existing and future net pen culture in fresh or marine waters...."

### Response

Ecology acknowledges the Department of Agriculture's support of the sediment impact zone concept. As needed, net pen operations

in Puget Sound will be eligible for sediment impact zones authorized through the SMS. Due to the unique discharge characteristics of net pen operations, Ecology has to-date established specialized sediment monitoring requirements within discharge permits for these facilities. The flexibility for establishing individualized monitoring requirements for different discharger types and case-by-case facility conditions is already included within the proposed SMS.

**Nancy McKay**

Comment

**B-3.** "...Rule adoption has been delayed to include issues involving sediment cleanup and to satisfy the concerns of affected parties. It is now time to move forward, adopt the rule, and deal with sediment contamination without further delay. Adoption of this rule will fill the "regulatory gap" concerning sediment quality and provide an important tool for cleaning up Puget Sound.... We have several other comments on specific aspects of the standards:

**B-4.** "The Authority fully supports Ecology's intent to form an implementation committee to address concerns that may arise during implementation of this rule. This approach will encourage the close cooperation among interests that resulted in the proposed standards. The committee can also review various technical components that are central to the rule such as the monitoring requirements and modeling updates.

**B-5.** "The Authority supports the alternative selected for determining the cleanup screening level, minimum cleanup level and sediment impact zone maximum chemical criteria. The criteria in common with PSDDA site condition II, will greatly simplify the implementation of sediment cleanup. This should accelerate cleanup actions, thus limiting harm to biological resources. Also, the other, less stringent alternatives would have been less protective of Puget Sound.

**B-6.** "The Authority is pleased that the rule is consistent with relevant aspects of the Puget Sound plan. Examples of this include using biological effects of the sediments and significant human health risk (reserved) to set the sediment standards, consistency with the plan's stormwater program, and adherence to the plan's public involvement policy.

**B-7.** "The Authority supports the use of the method that best predicts biological effects (e.g., Apparent Effects Threshold, Equilibrium Partitioning) when setting the individual chemical

criteria for sediments.

**B-8.** "The Authority commends Ecology on addressing the economic impact of this rule and the mitigation of its costs...."

Response

Ecology thanks the Puget Sound Water Quality Authority for its support in the development process for, and the content of, the proposed SMS. Ecology plans to convene an implementation committee for the SMS in the first half of 1991.

**G. Patrick Romberg**

Comment

**B-9.** "Metro supports the development of valid sediment standards that can be used to regulate contaminated sediment in Puget Sound. However, Metro is concerned that these standards be scientifically valid and sufficient to protect the marine environment at an appropriate level."

Response

Ecology acknowledges Metro's support of the need for sediment standards to regulate contaminated sediments in Puget Sound. The SMS incorporate requirements that have received rigorous peer and scientific review, including the sediment quality chemical and biological criteria. Other more innovative scientific methodologies included in the rule, (e.g., sediment impact zone models), have completed intensive development testing and are undergoing additional validation and refinement prior to application. Ecology has identified from the beginning of the rule development process that the "appropriate" environmental protection goal for the rule was "no adverse effects" to beneficial resources and no significant human health risk consistent with the Puget Sound Water Quality Management Plan and state and federal clean water laws.

Comment

**B-10.** "The proposed sediment regulations do not allow a decision maker or the public to know the level of protection that the standards provide either for the marine environment or for human health. Metro recommends that the regulation be delayed until Ecology has an opportunity to establish the level of protection and validate proposed methods."

### Response

The proposed SMS have been developed consistent with the approach used for other environmental media (e.g., surface water quality criteria and standards). The sediment quality criteria for Puget Sound identify the minimum conditions needed to protect the currently designated beneficial uses of the Sound. Human health sediment criteria are reserved in the proposed rule pending criteria development efforts in the future to fulfill the identified goal of no significant health threats to humans from sediment contamination. Ecology believes there has been sufficient development, refinement and validation of the proposed sediment quality criteria such that further delay in rule adoption is unwarranted.

### Comment

**B-11.** "The DEIS and Economic Analysis both show that the cost of implementing these standards will be high due to costs associated with monitoring and cleanup activities. However, the regulations provide no clear quantification of the true benefit either to the marine ecosystem or to human health. The DEIS simply indicates that there will be less risk at lower concentrations and greater risk at higher concentrations, which is too general for the large amount of resources involved."

### Response

Ecology has previously indicated that the proposed sediment quality standards incorporate consideration of the "significance" of biological effects (i.e., not all observable biological effects are considered ecologically important). However, these estimates of effects can not be fully quantified to define the full extent of environmental benefit, as limited available information would require the use of many difficult assumptions to conduct a quantitative environmental risk analysis. Information gathering to conduct a "benefit" analysis would require substantial additional resources than currently available for development of the standards. Ecology's approach for development of the sediment quality standards is consistent with protection/quality standards for other environmental media and Ecology's current regulatory policies. Following the established precedent of the federal Clean Water Act, the criteria therefore define full protection of the aquatic environment.

For a discussion on a similar comment please see Ecology's response to comment D-21.

### Comment



**B-12.** "Metro recommends that risk assessment/risk management be used to evaluate the proposed sediment standards. It is important that the level of protection and risk be determined so that appropriate decisions can be made to best guide the expenditures for achieving safe sediment conditions in Puget Sound."

Response

The SMS allow the use of risk assessment to identify a cleanup level within the range defined by the sediment quality standards and the minimum cleanup level. Further, risk assessment and risk management are considered the likely approach to establishing sediment criteria for the protection of human health, an effort Ecology plans to conduct in 1991. However, Ecology did not use a quantitative risk assessment to establish ecological protection "standards", i.e., the sediment quality standards or the minimum cleanup level. Ecological risk assessment requires quantitation of many relationships for which we have little or no data. The use of assumptions to compensate for these data gaps introduces a high degree of uncertainty thus exposing the standard itself to criticism. Additionally, we do not yet have accepted models or interpretation standards for ecological risk assessments. The chemical and biological tests contained in the rule provide an appropriate assessment of the ecological effects of sediment contamination.

Comment

**B-13.** "...Due to the lack of faith in the AET approach, Metro and others recommended that the sediment values be used as guidelines until such time that they can be validated...."

Response

The AET approach has undergone several years of interagency review and public comment in the Puget Sound region as well as a formal technical review by the EPA Science Advisory Board (SAB) in 1988. This process constitutes validation of the method for the intended use in managing sediment contamination in Puget Sound. The EPA SAB concluded that "The AET values produced from the Puget Sound data appear to work well in Puget Sound...Since AETs are currently being proposed for use as part of a process [the SMS] that involves site-specific biological testing, as opposed to broader, more generic application, this application seems to be consistent with the Subcommittee's recommendation." Ecology selected the AET approach as the currently preferred method for developing sediment quality standards that address adverse biological effects in Puget Sound because of its relatively high reliability in classifying Puget Sound sediments as "impacted" or "not impacted."

The reliability of the AET has been assessed using a large database comprising samples from 13 Puget Sound embayments (all biological indicators were not available in all embayments). In at least 85 percent of the available samples for each biological indicator, the approach either correctly classifies as "impacted" samples that exhibit adverse biological effects, or correctly classifies as "not impacted" samples that do not exhibit adverse biological effects. In addition to its reliability in classifying sediments, the AET approach can be used to provide sediment quality values for the greatest number and the widest range of chemicals of concern in Puget Sound. The approach also incorporates the widest range of biological indicators that are directly applicable to sediment conditions.

Ecology believes the most reliable criteria for predicting adverse biological effects in Puget Sound have been incorporated into the proposed SMS. To further compensate for remaining uncertainty, the standards provide for direct biological testing of sediments to confirm or override the predictions of chemical criteria. In order for the numerical criteria to be used to measure and/or evaluate projects and proposals from outside the agency, the Administrative Procedure Act requires their codification as a rule. Adoption of the sediment values in a rule is needed to prevent unpredictable, unenforceable, inconsistent and possibly unreliable regulatory and management practices which can result from the use of values as "guidelines."

#### Comment

**B-14.** "The AET values are not true cause/effect values, but are merely indicator values of the possibility that a biological effect could occur. A simple example of the inconsistencies in this approach is obvious with the HPAH values listed in Table I. This table lists the protective concentration for pyrene as 1000 mg/kg carbon; however, this value is 40 mg/kg carbon higher than the Table lists as the protective value for the sum of all HPAH compounds which is listed as 960 mg/kg carbon."

#### Response

Currently, no existing method can provide absolute proof that observed field effects are the result of a specific chemical. In the interest of environmental protection, Ecology has chosen to move ahead on the best information available. The proposed standards are based on a preponderance of evidence of the association between chemical contamination and adverse biological effects. The AET approach for Puget Sound represents the most reliable method to predict the presence or absence of adverse biological effects. To address remaining uncertainty, the rule

allows confirmatory biological testing to override sediment classifications based on numerical criteria alone.

Sediment quality standards for individual PAH compounds can be greater than the total for a couple of reasons. First, the determination of AET for individual PAH compounds and total PAH are conducted independently. Because individual PAH compounds do not perfectly covary in Puget Sound, total PAH do not covary with any individual PAH compound (and thus result in an AET for total PAH that corresponds to the sum of individual PAH compounds). Second, sediment quality values for different chemicals may be associated with different biological indicators, and would not be expected to display any interrelationship.

#### Comment

**B-15.** "Due to the problems with the AET values, it is essential that biological test results be allowed to overrule sediment classifications determined using AET chemical values. Bioassay tests demonstrate an effect on the test animals used. However, a toxic response in a bioassay does not necessarily mean that there will be a similar effect in the environment because the test animal may be different than the animals that live in the environment."

#### Response

Section 310 in the proposed SMS describes procedures for performing confirmatory biological testing, and states that the results of such tests override previous classification based on numerical chemical criteria.

Though often referred to as "no effects" criteria, the proposed SMS have considered and incorporated environmental significance in the selection of chemical criteria values and biological response criteria. The rules does not address many types of adverse effects which we are aware of, some of which we can measure and have elected not to incorporate into the criteria for practical as well as policy reasons. This is consistent with the approach of other environmental criteria, e.g., water quality criteria which are based on protection of 95 (not 100) percent of aquatic species and are still referred to as "full protection" of the aquatic environment. Ecology has selected ecologically relevant biological response criteria, including use of benthic infaunal abundance criteria, as the best scientifically available tools for prediction of adverse environmental effects in the field.

#### Comment

**B-16.** "Metro requests that Ecology include specific language in

the regulation clearly stating that the sediment standards are not intended to be used for natural resource damage assessments... If Ecology cannot include this wording in the regulation because of the opinion from the Attorney Generals office, then Metro requests a discussion in the responsiveness summary regarding limitations of the SMS to NRDA decisions."

#### Response

After careful consideration, Ecology will not include language regarding natural resource damage assessment in the rule. Ecology acknowledges that the SMS were not developed with the intent to define "injury", "damage", or "natural resource". However, future trustee programs or a court of law may review the rule for its applicability to these definitions and the natural resource damage assessment process in general. Ecology does not want to preclude the rule's utility to future agency programs or future case law interpretation.

#### Comment

**B-17.** "Ecology should not allow the microtox test to be used as the basis for failing the P2 standards, especially if the site has already passed chemistry or other bioassay tests. The environmental significance of the microtox test is unknown and the test is not used for decisions in the PSDDA process."

#### Response

The proposed SMS do not require conducting biological tests if the chemical criteria are met, but the rule does not preclude any interested party from also conducting the biological tests if they so desire. The PSDDA program does use the microtox test in establishment of chemical "Screening Level" values, which is consistent with the SMS approach. PSDDA does use the microtox in decisionmaking as a "confirmatory" test in conjunction with other bioassay results, but will not allow microtox bioassay results alone to trigger requirements for confined disposal of dredged material. In the SMS, regulatory decisions for sediment impact zones and sediment cleanup standards also apply the microtox test as a "confirmatory" and not a "stand alone" test. This is fully consistent with the regulatory approach to dredged material used by PSDDA.

As identified in the "Contaminated Sediments Criteria Report" <sup>1</sup> the

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<sup>1</sup> "Contaminated Sediments Criteria Report" by D. Scott Becker et. al., published by the Washington Department of Ecology, April 1989.

Microtox bacterium, (*P. phosphoreum*), is a member of the estuarine and marine pelagic communities. It is representative of the group of organisms that form the base of the detrital-based food web which play a major role in decomposing organic matter and making it available to higher organisms (e.g. benthic macroinvertebrates). Ecology acknowledges the uncertainty concerning the relationship between test endpoint (reduction in luminescence) and this ecological niche. However, Ecology has identified the microtox test to be a good indicator of adverse effects to benthic organisms. Additionally, the microtox test is quick, repeatable and inexpensive.

For these reasons, Ecology believes the test is a viable means of designating contaminated sediments but that its use as a confirmatory biological test should be as a surrogate chronic indicator of adverse effects. The rule also allows other chronic effects tests to be used instead of the microtox test.

#### Comment

**B-18.** "If Ecology or someone else intends to collect samples to confirm (or refute) an established classification, then the appropriate NPDES permit writer should be notified in advance so they can approve the sampling plan and insure appropriate chain of custody for the samples. Ecology should also notify the permittee of the pending actions prior to the sampling time and should seek to avoid repetitive challenges that will increase monitoring costs for the permittee."

#### Response

Ecology agrees that close coordination with the pertinent permit writer and discharger is necessary and beneficial where additional sampling and testing efforts are planned to confirm the established designation of any sediment station. Ecology will identify this coordination need internally as part of its SMS implementation plan and ensure its implementation through internal training activities.

#### Comment

**B-19.** " Metro agrees that there is need for Ecology to conditionally approve sediments with concentrations above the P2 sediment standard. This is especially true in urban embayments where elevated chemical levels exist that may never be brought down to the P2 level. Metro and others initially supported the development of multiple standards, but subsequently agreed to go along with the SIZ approach provided it could be shown to be workable."

#### Response

Ecology acknowledges Metro's agreement with the need to allow conditional exceedances of the sediment quality standards. We believe multiple standards are an inappropriate answer to the need for flexibility in sediment source control and cleanup programs. Development of multiple standards would require additional time and resources far beyond Ecology's ability. And the contamination levels allowed by multiple standards would not provide the necessary protection of all beneficial uses. Ecology is committed to completion of ongoing refinement and validation tasks to demonstrate the workability of the sediment impact zone concepts and procedures contained in the proposed SMS.

#### Comment

**B-20.** "Clarification is needed regarding when to apply for an SIZ and whether the conditions of AKART are satisfied for dischargers with approved long range facilities plans. Metro has a 20-year Facilities Plan that has been approved by Ecology as meeting the requirement of greatest reasonable reduction at the earliest possible date. It is Metro's understanding that these facilities would be considered to satisfy AKART for both POTW's and CSOs and they would be eligible for an SIZ consistent with the approved Facilities Plan. Metro requests this question be specifically answered in the responsiveness summary."

#### Response

Application requirements for sediment impact zones are contained in section 415(2)(b) of the proposed SMS. The rule requires that an application for a sediment impact zone be submitted to Ecology when either Ecology requires the sediment impact zone application by written notification, or a discharger independently determines that the discharge in question violates, shall violate, or creates a substantial potential to violate the sediment quality standards in section 320 through 340 of the rule.

Although Ecology does not agree that 20 year facility plans for POTWs and CSOs constitute AKART, the plans do address how AKART will ultimately be achieved for the discharges in question. Ecology also understands that these plans are subject to update every 5 years. Because facility plans must meet current legislative requirements for addressing maximum practicable reduction, further reduction or acceleration of compliance time frames may not be possible. Ecology considers that sediment impact zones may be issued for POTW and CSO discharges with facility plans (regardless of whether they meet AKART), but they will be subject to all the requirements of the SIZ process in the rule including the SIZmax concentration requirements. Exceedances of the SIZmax may trigger review of the facility plan for

compliance with the SMS at the next 5 year update, and SIZ monitoring and maintenance activities per the requirements of the proposed rule.

Comment

**B-21.** "Metro believes that there must be more flexibility in establishing the maximum chemical criteria for sediment impact zones (Max SIZ). In addition to biological testing, the regulation should include a provision that allows the value for maximum SIZ concentration for individual chemicals be adjusted upward if there is overriding evidence based on risk assessment analysis...."

Response

Ecology believes there are adequate measures of flexibility contained within the proposed SMS. The concept of a sediment impact zone was included in the rule to provide flexibility in source control decisions. The SIZmax values establish an upper bound to this intended flexibility. Exceptions to this upper bound are provided in the rule for stormwater discharges. In addition to allowing biological testing to overrule SIZmax chemical criteria, the rule provides for adjustment to permit requirements based on field evaluations of the SIZ. A final measure of flexibility is provided in the administrative policy allowing for use of "alternate technical methods" (section 130(4)). Given these measures of flexibility, Ecology believes that the SIZmax should be adopted as proposed because the rule provides adequate flexibility while ensuring protection of beneficial resources.

Regarding risk assessment, please see Ecology's response to Mr. Romberg's comment B-12 above.

Comment

**B-22.** "More verification of the sedimentation model is needed before it can be accepted and used for any regulatory decisions beyond determining that more monitoring is needed....it should not be used to restrict the size of the SIZ...."

Response

Ecology selected CORMIX and WASP4 to identify and support the designation of sediment impact zones after conducting a regional workshop with modeling experts, follow-up review of promising models, and field testing of model at three case study site in Puget Sound which was summarized in "Recommended Sediment Impact

and Recovery Zone Models".<sup>2</sup> CORMIX and WASP4 are fully supported by EPA with training programs, technical advice, and software updates. Both CORMIX and WASP4 will be used to identify impacts from discharges where exceedances of the sediment quality standards are expected and to provide an assessment of the size and severity of anticipated sediment impact areas using the best available information about the site and discharge. The models will also be used to guide decisions regarding monitoring density and frequency. Ecology agrees with the need to further refine and verify the sediment impact zone models, but believes this work will occur over a number of years and is not necessary to complete prior to regulatory application of the rule. Refinement and verification work tasks can and should be ongoing and related to continuing development and broad-based implementation of sediment source control and cleanup programs.

#### Comment

**B-23.** "There should be a clear definition of what input parameters are needed to run the model and what happens to the model predictions if site specific input data are absent or very limited...In one of the few examples where Ecology compared the modeling results with the actual environmental data, it found that the model over estimated sediment concentrations by as much as a factor of three. If this represents the accuracy with the best input data then even greater error would be expected with less input data. This level of error would have a significant effect on the ability to define an accurate SIZ."

#### Response

Details of model input parameters are provided in the EPA user's manual (EPA 1988)<sup>3</sup> and in the case study analysis conducted under the direction of Ecology in the report "Recommended Sediment Impact and Recovery Zone Models".<sup>4</sup> Because the model is flexible, the level of detail used to specify model input requirements can vary from a very general characterization of the discharge,

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<sup>2</sup> "Recommended Sediment Impact and Recovery Zone Models" by PTI Environmental Services, published by the Washington Department of Ecology, January 1991.

<sup>3</sup> WASP 4, A Hydrodynamic and Water Quality Model--Model Theory, User's Manual, and Programmer's Guide, by U.S. Environmental Protection Agency, 1988.

<sup>4</sup> "Recommended Sediment Impact and Recovery Zone Models" by PTI Environmental Services, published by the Washington Department of Ecology, January 1991.



associated chemicals, and the receiving environment based on available information, to a comprehensive, site-specific specification of site dimensions, discharge characteristics, chemical properties, and receiving water dynamics. If an early, generalized assessment using worst-case assumptions indicated that the site was not anticipated to require a SIZ, no additional modeling would be required. This flexibility is intended to focus modeling and monitoring efforts on problem discharges. Results of monitoring efforts will also be used to adjust SIZ requirements as a final verification of model predictions.

The case studies were not intended to demonstrate the highest level of accuracy possible using the WASP4 model, but rather to demonstrate the model's usefulness and general characteristics using available information. Ecology will address the uncertainty due to the models' predictions in sediment impact zone implementation guidance documents to be developed in 1991.

#### Comment

**B-24.** "Ecology should use a phased approach to implementing both the SIZ and MCUL standards. There should be a few specific discharges and one or two specific geographical areas that are used to validate the SIZ approach before SIZs are required on a broad scale. The results of this verification process should be reviewed publicly by a technical work group before proceeding with further implementation. Metro requests this be addressed in the responsiveness summary."

#### Response

Ongoing refinement and verification activities will focus on one or two geographical areas and possibly a range of discharger types and cleanup sites. Ecology believes broad based implementation of the source control and cleanup standards will be possible at the conclusion of the refinement and verification studies. Phasing of implementation will occur primarily through allocation of agency resources to priority source control and cleanup actions. Ecology plans to establish an "implementation committee" for review of the refinement and verification work, and implementation guidance and training documents and activities.

#### Comment

**B-25.** "Ecology should insure it applies the modeling approach to a complicated site for validation including overlapping discharges and load allocation requirements. This type area presents the greatest problem for applying the SIZ approach and has been the area of greatest concern for potential permittees."

### Response

Application of the model to a complex, multi-source site will be conducted during the next round of model testing. WASP4 has been applied to multi-source sites in other parts of the country. Ecology currently plans to develop load allocation policies and methods beginning in fiscal year 1992 (July 1991).

### Comment

**B-26.** "Inherent uncertainty in the model predictions make it essential that the 10 year equilibrium value be used as a guide and not an absolute value that dictates major decisions regarding discharge modifications. A careful evaluation of the modeling uncertainties would be required before determining the appropriate course of action necessary to comply with the standards. It seems reasonable to use about 10 years as an equilibrium time for assessing accumulation potential and indicating the need for monitoring to track the situation."

### Response

The proposed SMS as written apply the 10-year value as a time-frame for modeling the impact of the discharge being evaluated. This timeframe consists of two permit cycles, representing a period beyond which it is difficult to predict future discharge technology requirements and their consequences to effluent and sediment quality. The 10-year period also provides a cap on the resources required to run the model. Equilibrium between the discharge and the receiving sediments may or may not have been reached within the 10-year modeling period. However, if the model predicts that the sediment quality standards would be exceeded as a result of the discharge during this period, a sediment impact zone would be required. Also, exceedance of the sediment quality standards within the 10-year period does not necessarily require discharge modifications. The rule enables the discharger to review the results of the model(s) application and to submit alternate modeling results that could change the department's findings. Finally, Ecology's planned refinement and validation efforts will identify the range of modeling uncertainties and their impacts on broad based implementation of the model.

### Comment

**B-27.** "Additional explanation is needed in the regulation to clarify that sediment contamination resulting from historic or unknown sources will not be used to limit the SIZ conditions for current dischargers. For this approach to work the sedimentation model must be validated and the predictions accepted as an accurate representation of existing discharge conditions."

### Response

Ecology believes the rule adequately provides the requested statement which reads "The department shall not limit a sediment impact zone authorization via consideration of surface sediment contamination determined by the department to be the result of unknown or unpermitted or historic discharge sources" or facsimile in section 410(4) and section 415(2). Additionally, the rule identifies in multiple locations that the sediment impact zone requirements are only triggered when sediment contamination is a result of the ongoing discharge. If the model is run to steady state conditions, the effects of historical sediment contamination are excluded from consideration. If the model shows decreased contamination at the end of 10 years, the model run can be continued to steady state or re-run with a different baseline (background) contamination.

Please see Ecology's response to Mr. Romberg's comments B-22, B-23, and B-25 for clarification on model application and validation efforts.

### Comment

**B-28.** "Metro believes it is unnecessary and unreasonable to require a specific closure plan as a condition for obtaining a SIZ. Ecology has indicated it intends to use a ratchet approach to eventually eliminate every SIZ. However, there are complicated issues regarding feasibility and schedule that will take time to discuss and resolve. During the initial application Ecology should require only information regarding existing facility plans."

### Response

Although Ecology believes it is appropriate to include closure planning requirements with a sediment impact zone (SIZ) application, Ecology does not intend to mandate any specific SIZ closure method. The intent of this requirement is to require the discharger to consider the method of SIZ closure, i.e., active vs. natural recovery with monitoring, and to identify the costs of these alternatives. A general policy statement within the rule identifies that where possible sediment impact zones should be reduced or eliminated (i.e., ratcheting), but this does not preclude unplanned closures due to unforeseen events. Ecology believes it is prudent to require upfront planning for eventual closure of the SIZ by the discharger. **Ecology will modify the proposed rule to clearly indicate the discharger is to identify the preferred method for SIZ closure and the associated costs as**

the closure planning requirements.

Comment

**B-29.** "...The approach of area-weighted averaging appears reasonable, but a priority should be given to obtaining and using only the most current data available for each area in the analysis. The SEDQUAL data base should be updated before the analysis. A verification process is needed to insure that the proposed ranking approach is providing logical results before it is used to define the official list of sites."

Response

After consideration of comments received on the proposed SMS, Ecology has removed the concept of area-weighted averaging from the rule. The final rule was modified to simply require averaging of the three highest contaminated stations (for chemical contaminants) and comparison to the appropriate screening levels.

Ecology agrees the SEDQUAL data base should include the most recent data available for conducting screening evaluations. The ranking system will be field verified before developing an initial list of sites. And the site list will be screened to ensure consistency with existing information and professional judgment.

Comment

**B-30.** "Metro agrees with the concept of defining certain chemical concentrations as Cleanup Screening Levels (CSL)....It is not necessary that the screening levels equal the cleanup levels to have a workable system."

Response

Ecology acknowledges Metro's support of the CSL concept, though believes it is preferable to establish the CSLs at the same level as the minimum cleanup levels. If the minimum cleanup level defines the minimum degree of cleanup necessary to ensure acceptable protection of environmental and human health, then there is no defensible basis for not including a more contaminated area in the ranking/priority list process.

Comment

**B-31.** " Metro believes that there should be more flexibility allowed for arriving at the Minimum Cleanup Level for a

remediation site. In addition to bioassay tests, there should be a provision included to allow risk assessment/risk management to be used to establish the appropriate cleanup level...."

#### Response

The SMS allow the use of risk assessment to identify a cleanup level within the range defined by the sediment quality standards and the minimum cleanup level. Further, risk assessment and risk management are considered the likely approach to establishing sediment criteria for the protection of human health, an effort Ecology plans to conduct in 1991. However, Ecology did not use a quantitative risk assessment to establish ecological protection "standards", i.e., the sediment quality standards or the minimum cleanup level. Ecological risk assessment requires quantitation of many relationships for which we have little or no data. The use of assumptions to compensate for these data gaps introduces a high degree of uncertainty thus exposing the standard itself to criticism. Additionally, we do not yet have accepted models or interpretation standards for ecological risk assessments. The chemical and biological tests contained in the rule provide an appropriate assessment of the ecological effects of sediment contamination.

#### Comment

**B-32.** "Metro agrees with the need to allow recovery zones that will improve in 10 years due to natural processes. This approach should allow Ecology and others to focus available resources on the areas that are of highest priority."

#### Response

Ecology acknowledges Metro's support of sediment recovery zones and natural recovery zone processes. However, other public comment on the proposed SMS has identified that Ecology's intent concerning incorporation of time in the selection of a cleanup action decision, section 580, is unclear. Ecology will modify the proposed SMS section 580 (2) to clarify consideration of time and other factors in the selection of a remedial alternative to meet the selected cleanup level. **Section 580 will be clarified to identify that selection of a remedial alternative to effect site cleanup to the identified cleanup standard (identified via section 570) will not be limited by implementation time.**

The proposed rule does indicate in section 570, Sediment cleanup standards, that identification of the site cleanup standard must be within the range between the sediment quality standards and the minimum cleanup level, and may incorporate considerations of time up to a limit of 10 years.

Comment

**B-33.** "Implementation of sediment standards for the first 5 years should be carried out by the sediment management group that was involved in the standards development... Ecology has acknowledged there is need for validating the SI2 and MCUL approaches and Metro believes it is critical that this validation be done through the group that developed the standards framework. Metro requests this issues be discussed in the responsiveness summary."

Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The key work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key issues of implementation and rule interpretation will be directed by the Sediment Management Unit.

Comment

**B-34.** " Ecology must insure that there is opportunity for an open dialogue between the permit applicant and the permit writer before the permit is drafted.... This approach is not possible under the current procedures given to permit writers and will jeopardize implementation of the sediment standards. Metro requests that this issue be discussed in the responsiveness summary."

Response

The communication process currently used by Ecology permit writers is described in the department's Permit Writer's Manual. It was developed with the assistance of both an internal and external advisory group. This process expressly encourages early communication between the permit writer and permittee to ensure that the draft permits are factually correct. However, to ensure equal public access to permit decisions, the process does not provide for communication on permit conditions until after the draft permit is issued to interested parties. Ecology agrees that improvements to the current communication process need to be developed between permittees, the public, and Ecology. The process contained in the Manual is considered to be an interim process pending future refinement. Ecology's Water Quality Program is currently responsible for improvements to the permit communication process. Revised guidance in the Permit Writer's

Manual is scheduled for the end of 1991.

Comment

**B-35.** "The regulation should include a clear statement that the sediment standards are not effluent limits and therefore are not subject to federal antibacksliding regulations.... Metro requests this issue be discussed in the responsiveness summary."

Response

Ecology investigated the "anti-backsliding" issue early on in the development of the proposed SMS. After careful consideration of this issue with the Office of the Attorney General, **Ecology has decided to include a statement within the proposed rule stating that the sediment criteria and sediment impact zones are not considered to be "effluent limits" pursuant to federal discharge permits.** Ecology understands that the SMS would not subject to federal anti-backsliding provisions, but that "effluent limitations" within an NPDES permit based on requirements of the SMS would be subject to anti-backsliding requirements.

Comment

**B-36.** "Metro has a general concern that Ecology is developing a regulatory system for cleaning up sediments that only addresses those sediments that are associated with a current NPDES permitted discharge. There are undoubtedly many contaminated areas that are either due to unknown sources or historic sources and there should be a program to address these sediments in a timely manner."

Response

The proposed SMS currently incorporate different cleanup authorities and cleanup types to acknowledge that not only sediment contamination from known sources shall be cleaned up, but also sediment contamination which results from historic or unknown or unpermitted sources. Programs for cleanup of contaminated sediments due to historic or unknown or unpermitted sources may be conducted under the Water Pollution Control Act, Chapter 90.48 (for historic permitted sites), the Model Toxics Control Act (Chapter 70.105D), or the federal Comprehensive Environmental Response and Compensation Act (CERCLA). Federal contaminated sediment cleanup actions may determine on a case-by-case basis the applicability or relevance and appropriateness of the SMS (once adopted and effective) to proposed cleanup actions. **The proposed rule will be modified by Ecology to clarify section 550, Types of cleanup and authority. The final rule will specifically recognize that contaminated sediment cleanup actions may occur under federal CERCLA authority.**

**Ruth A. Nelson**

Comment

**B-37.** "There is no provision for disposal of contaminated sediment that must be removed under the regulation. The proposal will cause an unimaginably complicated disposal problem... There is no companion program proposed in the regulations that tells how and where this waste will be disposed...."

Response

It is true that the proposed SMS do not provide for or address disposal of "contaminated" sediments. Much like the state Water Quality Standards, Chapter 173-201 WAC, the proposed rule has been developed to identify sediment quality standards for prevention, control and cleanup activities to protect the environment and human health. Ecology is currently drafting "Dredged Material Management Standards" which will address removal, transportation and disposal methods for contaminated sediments in a manner which will ensure protection of the environment and human health. However, neither of these rule development efforts are aimed at defining disposal needs or providing such disposal sites.

Pursuant to element S-6 of the Contaminated Sediments and Dredging Program in the Puget Sound Water Quality Management Plan, Ecology has conducted a study to identify the utility and viability of establishing a multiuser disposal site for contaminated sediments.

This effort did indeed define a need for such disposal but also identified that Ecology does not have statutory authority to establish such a disposal site. Ecology is working with state and federal agencies, port districts and others to continue cooperative efforts among the interested parties in establishing a multiuser site "action plan". This plan will identify costs and funding alternatives, general siting criteria, and propose a cooperative effort between the key parties and their roles to actually site a multiuser site.

Currently, disposal of contaminated sediments may still be conducted on a case-by-case basis obtaining necessary permits depending on the proposed location of the disposal site, i.e., in-water, nearshore or upland.

Comment

**B-38.** "The Permitting Process required by the regulations will effectively shut down any remediation efforts for years. Under



the definitions of "no adverse effects," virtually every discharger will be required to apply for a Sediment Recovery Zone permit or face undefined sanctions... These regulations should not become effective until a well-defined permitting process is in place including the bureaucratic apparatus necessary to process the applications expeditiously."

#### Response

The proposed SMS do not establish any new permitting process. Sediment impact zone authorizations are not a permit, they are an authorization within an existing waste discharge permit. Sediment recovery zones are authorized by Ecology's approval of the cleanup report defined in section 560, Cleanup study, section 580, Cleanup decision, and section 590 Sediment recovery zones. There is no need for widespread application for SRZ's as the rule specifically states (section 110(1)) that the SRZ requirements (section 590) are only applicable where a cleanup decision is made.

Ecology's technical development studies to-date on sediment impact and recovery zones indicates that the need for such zones may not be widespread, but will be dependent on the discharge's effluent quality and associated receiving-water characteristics. Ecology believes the existing permit system(s), along with recently proposed improvements, can effectively implement the SMS. There is no reason to further delay adoption of the proposed rule for this regard.

#### Comment

**B-39.** "The regulations subject industry to sweeping requirements without setting clear standards for enforcement and without clearly defining penalties...."

#### Response

Much like the state Water Quality Standards, Chapter 173-201 WAC, the proposed rule has been developed to identify sediment quality standards for prevention, control and cleanup activities to protect the environment and human health. The proposed SMS set very clear standards for necessary environmental protection levels while leaving human health standards "reserved" for development in the near future.

Enforcement of the proposed standards, similar to current enforcement of the Water Quality Standards, will primarily be through already defined enforcement and penalty mechanisms contained in the Water Pollution Control Act (WPCA), Chapter 90.48 RCW, and the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

**The rule will be modified to include a policy statement in**

**section 130 that identifies enforcement of the SMS shall be taken as necessary pursuant to the pertinent authorizing legislation.**

Comment

**B-40.** "It is pointless to regulate the conduct of industries and municipalities unless consumer conduct is regulated as well...."

Response

Ecology agrees that it is extremely important to provide public education and involvement efforts necessary to gain the voluntary cooperation of all citizens for protection of the environment. These activities have been ongoing for the last three to five years for sediment quality. And Ecology's Waste Reduction and Recycling Program has targeted the general public for several years in its information and education efforts to minimize waste production, recycle, and properly dispose of wastes. Ecology's public information and education efforts are meant to educate all the public including those involved with industrial and commercial facility operations. We also recognize that the quality of municipal stormwater discharges and their effect on the environment are greatly affected by the public's knowledge and commitment to restore, maintain and protect a clean environment.

**Eric Johnson**

Comment

**B-41.** "It is well known that the Governor's Efficiency Commission is in the final stages of its report on the Department of Ecology's wastewater discharge permit program. Unfortunately, this document is not available to the public prior to the comment deadline for this rule. However, the recommendations of this Commission are likely to have significant impacts on the implementation of the sediment management standards."

Response

Ecology plans to incorporate the recommendations of the Governor's Efficiency Commission into the Sediment Management program as applicable. We do not believe there will be a "significant impact" on the implementation plan or schedule for the SMS. Ecology believes that completing its effort on the current draft "implementation plan" for the SMS will provide for the needed consistency with the recommendations contained in the Efficiency Commission's report. Completion of the implementation plan will identify a schedule for intraagency training and application of sediment source control activities for "major" dischargers first.

The draft implementation plan will be submitted to the SMS implementation committee for review and comment before finalization.

Comment

**B-42.** " We also have concerns about a new and largely untested sediment program being incorporated into the NPDES program without explicit protection from the anti-backsliding provisions of the NPDES program... The rule should indicate that some sediment management requirements, because of their regulatory novelty, should be outside the scope of the anti-backsliding provisions."

Response

Ecology investigated the "anti-backsliding" issue early on in the development of the proposed SMS. After careful consideration of this issue with the Office of the Attorney General, **Ecology has decided to include a statement within the proposed rule stating that the sediment criteria and sediment impact zones are not considered to be "effluent limits" pursuant to federal discharge permits.** Ecology understands that the SMS would not subject to federal anti-backsliding provisions, but that "effluent limitations" within an NPDES permit based on requirements of the SMS would be subject to anti-backsliding requirements.

Comment

**B-43.** "An additional mechanism for preventing unintended rigidity and misunderstandings is for the sediment portion of future NPDES permits to be under the direct supervision of the Sediment Management Unit of Ecology's Central Programs division."

Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The key work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key issues of implementation and rule interpretation will be directed by the Sediment Management Unit.

Additionally, as a result of the SMS Workgroup, Ecology has committed to formation of an implementation committee to review the department's sediment impact zone implementation guidance documents and implementation activities for source control and

cleanup activities mandated in the proposed rule. The implementation committee should be an excellent gauge on the consistent application of the SMS.

Comment

**B-44.** "There is also some concern about the heavy reliance of this rule on the Permit Writer's Manual. Although this manual is a very important document, any general principles contained in it which are critical to the success of the sediment program should be spelled out specifically in this rule. The Permit Writer's Manual is not a promulgated rule, and should not be treated as such."

Response

Ecology agrees that the Permit Writer's Manual is a very important document to the success of the SMS implementation program. Ecology also understands that specific reference to the Permit Writer's Manual within the rule subjects the manual to public notification requirements of the Administrative Procedure Act. Thus, interested parties will always be kept abreast of implementation guidance changes concerning the SMS.

As implementation guidance is developed for inclusion in the Permit Writer's Manual, Ecology will seek the recommendations of its SMS Implementation Committee and the public concerning incorporation of general principles into the rule. To this end, Ecology has included an administrative policy within the proposed rule to annually review and to modify the rule every three years or as necessary. These activities should ensure that necessary modifications of the rule occur to incorporate new implementation information and latest scientific knowledge.

Comment

**B-45.** "One of the clear recommendations of the Sediment Policy Work Group [Sediment Management Standards Workgroup] was that this rule would need a significant amount of flexibility, as well as communication with other groups, in order to work. Ecology must follow the recommendation of this group to form a sediment policy advisory body to help in program implementation."

Response

Consistent with the recommendations of the SMS Workgroup, the rule contains numerous features aimed at providing flexibility in the application of rule requirements. Ecology has committed to formation of an implementation committee to review the department's sediment impact zone implementation guidance

documents and implementation activities for source control and cleanup activities mandated in the proposed rule. The implementation committee should be an excellent gauge on the consistent application of the SMS.

Additionally, Ecology is committed to finalization of the SMS implementation plan which will identify coordination and communication needs and mechanisms with other regulatory programs inside Ecology. Ecology will submit the draft implementation plan to the SMS implementation committee for review and comment before finalization of the plan.

Comment

**B-46.** "Finally, the notification letters regarding sediment impact and recovery zones are a very important part of this overall process. For many persons these letters will be the first and only explanation of this very complicated program. For this reason, Ecology must craft these letters in close consultation with the proposed sediment policy advisory body."

Response

Ecology expects that the development of notices and approval/denials to be issued by Ecology for implementation of the SMS to be a key discussion issue with the SMS implementation committee. Ecology also expects to closely coordinate with the Office of the Attorney General concerning the format and content of such documents. Ecology will make every effort to consider the recommendations of the implementation committee in this regard.

Comment

**B-47.** "In addition, the rule needs to be clear that the sediment quality standards of Sections 320-340, 400-420, and 590 do not apply to pollutants from a natural (non-anthropogenic) source... This rule must have an explicit mechanism for dealing with these instances."

Response

The proposed SMS incorporate references to nonanthropogenically affected sediment quality in the sediment quality standards, Part 3 of the rule, and in the sediment source control and cleanup standards, Parts 4 and 5 of the rule, respectively. In some cases sediment quality standards will be set at the naturally occurring higher chemical concentration or biological effects levels and require that source control and cleanup actions ensure protection to meet the naturally occurring levels.

The proposed SMS should continue to include requirements for source control and cleanup actions to protect the existing quality of naturally higher chemical concentration or biological effects levels which occur in nonanthropogenically affected sediments.

**Pat Petuchov**

Comment

**B-48.** "The Sediment Quality Standards appear to be within standard range and utilizes adequate marine biota indexes."

Response

Ecology acknowledges the Nooksack Tribe's support of the sediment quality standards.

Comment

**B-49.** "The freshwater sediment quality standard is eagerly anticipated, due to our direct involvement in the Nooksack River Watershed."

Response

Ecology is currently conducting literature review activities to identify an approach to establishing freshwater sediment chemical criteria and biological tests. Ecology plans to identify interim freshwater sediment chemical and/or biological criteria by the end of 1991.

Ecology is working to fulfill the reserved section of the SMS concerning freshwater sediment criteria. Ecology is conducting a study to determine the national and international status of freshwater sediment criteria for Washington. The study includes an extensive literature review, identification of potential approaches to establish chemical and biological criteria, identification of potential approaches to establish chemical and biological criteria, identification of applicable data bases, sampling and analyzing sediments from various sites in Washington, and conducting bioassays and benthic studies. These efforts are meant to allow Ecology to identify interim freshwater sediment chemical and/or biological criteria by the end of 1991.

**Christopher Gibson**

Comment

**B-50.** "I support the concept of improving sediment quality through source control and cleanup and applaud the efforts of your department to develop a workable set of rules and standards."

Response

Ecology acknowledges this comment.

Comment

**B-51.** "I believe special consideration should be made for existing and future net-pen culture with regard to the loss of certain benthic species. The quality of the discharge and reversible nature of the impacts justifies this special consideration."

Response

Ecology has expanded the sediment quality standards within the proposed SMS to incorporate "other toxic, radioactive, biological, or deleterious substances" sediment criteria. These sediment quality criteria provide the mechanism to address the impacts of unique discharges (e.g., net pens, log storage), on sediment quality which may affect beneficial resources or human health. Additionally, Ecology's implementation development activities will focus on specific issues e.g., monitoring, to address such facilities. Due to the unique discharge characteristics of net pen operations, Ecology has to-date established specialized sediment monitoring requirements within discharge permits for these facilities. The flexibility for establishing individualized monitoring requirements for different discharger types and case-by-case facility conditions is already included within the proposed SMS.

**Daniel Syrdal**

Comment

**B-52.** "Our most general concern relates to the use of P-2 AET's as the basis for the sediment standards. As you know this methodology does not even attempt to deal with cause and effect and ignores many, very pertinent factors in a cause and effect relationship."

Response

Currently, no existing method can provide absolute proof that observed field effects are the result of a specific chemical. In the interest of environmental protection, Ecology has chosen to move ahead on the best information available. The proposed standards are based on a preponderance of evidence of the association between chemical contamination and adverse biological effects. The AET approach for Puget Sound represents the most reliable method to predict the presence or absence of adverse biological effects. To address remaining uncertainty, the rule allows confirmatory biological testing to override sediment classifications based on numerical criteria alone.

#### Comment

**B-53.** "Furthermore, as set forth in a paper entitled "Comments on Apparent Effects Threshold (AET's)" prepared by Battelle Ocean Sciences in June of 1989, there are many reasons for not using AET's as the initial chemical indicator of biological damage in the sediments resulting from chemical contamination. As that document demonstrates, the use of no observable impact level (P-2) AET's as the baseline sediment quality standards is overly conservative in predicting significant adverse effects on the marine biota... By using such conservative levels as the baseline standards, extreme amounts of confirmatory biological testing, biomonitoring, modelling and other expensive procedures will be required for sources which don't justify this approach."

#### Response

Battelle (1989) proposes a variation on sediment quality objectives by defining an "ecologically significant benthic effects AET". This proposed alternative is defined as the occurrence of significant benthic infaunal depressions in more than one major taxonomic group. Ecology considered a similar alternative during the development of approaches to sediment quality values, which was termed the "severe effects benthic AET", and was defined as the sediment concentration above which statistically significant benthic infaunal depressions occurred in more than one major taxonomic group. However, Ecology believes the sediment quality standards should be based on a "no effect" goal, not on the identification of "significant" effects. In addition, the use of severe effects AETs was one alternative considered for setting  $SIZ_{max}$ , CSL, and MCUL. Based on the analysis performed in the environmental impact statement, the recommended "significant" effects alternative is considered to have unacceptable environmental impacts.



Additional responses to comments presented in Battelle (1989)<sup>5</sup> on the AET approach can be found in the responsiveness summary to the Commencement Bay Record of Decision (EPA 1989)<sup>6</sup>, pages B-15 through B-23.

#### Comment

**B-54.** "...Because of the peculiarities of many sites, it will often be impossible to find an appropriate reference area that is both uncontaminated and provides an appropriate "match" in sediment and environmental conditions. We would, therefore, request that the Department include in these regulations a mechanism allowing the use of professional judgment to demonstrate the degree of impact in a given sediment area. If an area shows a degree of benthic infaunal abundance and diversity which demonstrates a healthy environment, it should not be determined to need cleanup just because it fails chemistry tests which ignore cause and effect of an appropriate reference site can not be found."

#### Response

Ecology recognizes that it may not always be possible to find a reference area that exactly matches a study area in all characteristics with the exception of chemical contamination. However, it is unlikely that it will "often be impossible to find an appropriate reference area." Ecology has expended considerable effort in identifying reference areas for a variety of sediment types, and we expect the locations of these areas and performance standards for evaluating the suitability of sediments from those areas for use as reference sediments will be specifically incorporated into the SMS in the future.

It is possible to override the designation of sediments based on initial chemistry by conducting confirmatory biological testing. The proposed SMS require that such testing include an assessment of acute and chronic biological effects. These biological tests allow use of lab tests not requiring a benthic study. A demonstration of high abundance and diversity for benthic infaunal abundance by itself should not be allowed to override a sediment designation because a benthic community may have both attributes

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<sup>5</sup> "Comments on Apparent Effects Thresholds (AETs)", by Battelle Ocean Sciences, 1989.

<sup>6</sup> "Commencement Bay Nearshore/Tideflats Record of Decision", Prepared for U.S. Environmental Protection Agency, Olympia WA. by Tetra Tech, 1989.

and still be significantly altered from the community that would exist in that sediment in the absence of anthropogenic effects. Instead, it must be demonstrated that the abundances of several major taxa are not significantly reduced.

It should also be noted that the proposed SMS include a thorough decision process to determine that a sediment cleanup action will be required. This process includes a screening and ranking process prior to requiring a cleanup action. Additionally, actual removal of contaminated sediments will be based on a site-specific cleanup study and report required by the SMS. The cleanup action decision framework of the proposed SMS allow site-specific impact assessments to be considered.

#### Comment

**B-55.** "Many permittees attempting to deal with these regulations will not have, and can not be expected to have, the necessary expertise to utilize the models specified even if the data were available to do so. In these cases, the Department's sediment management unit should provide such service."

#### Response

Although the proposed SMS provide the flexibility for permittees to utilize the sediment impact zone models, Ecology expects to initially conduct the modeling in many cases. The Sediment Management Unit will begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. This effort will include application of the sediment impact zone models. During this time, key issues of implementation and rule interpretation will be directed by the Sediment Management Unit.

It is important to note that both sediment impact zone models are available to the public, and Ecology's implementation activities will be focusing on enabling public use of the models to meet the proposed sediment impact zone requirements. These activities will include definition of the input information necessary to run the models and training sessions for the public on use and interpretation of the models.

#### Comment

**B-56.** "...Most, if not all, of the sediment decisions called for in these draft regulations require a great deal of expertise, and, therefore, should only be done by the Department's sediment management unit, as opposed to permit writers and other employees without a great deal of experience and expertise in this area. The draft regulations should be amended to require this."

### Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The key work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key issues of implementation and rule interpretation will be directed by the Sediment Management Unit. It is unnecessary to limit the agency's flexibility for implementing the sediment management program by mandating specific agency program implementation functions within the rule.

### Comment

**B-57.** "Because of the tremendous information requirements that could be necessary to utilize the models for complex urban embayments, the regulations must also be modified so that each source into such areas is not required to provide all the information which may be necessary to conduct load allocations and other contemplated modelling...."

### Response

Ecology believes the intent of the authorizing legislation cited for development and adoption of the SMS clearly establish the responsibility of any discharger to provide all information necessary to define any impact of the discharge on the environment and/or human health. Although Ecology believes it is essential to acknowledge each discharger's legal responsibility for submittal of pertinent information for authorization of a sediment impact zone, where possible Ecology will seek to reduce the impacts to each discharger through cooperative efforts between all dischargers and Ecology. In complex urban embayments, Ecology expects some types of information (e.g., receiving environment characteristics) will be common to multiple sources. Other types of information (e.g., effluent and contaminant characteristics) will be source-specific.

### Comment

**B-58.** "...The Department should also recognize in these regulations that implementation of the modelling approach will be, by necessity, a gradual process which will build on itself as more information is developed...."

### Response

Ecology agrees that refinement and verification of the sediment impact zone models will occur over a number of years and is not necessary to complete prior to regulatory application of the rule.

Refinement and verification work tasks can and should be ongoing and related to continuing development and broad-based implementation of sediment source control and cleanup programs. Ecology believes section 130, Administrative policies, adequately establishes the department's intent to modify the proposed SMS to address use of the latest scientific knowledge, including specific improvements to sediment impact zone models resulting from ongoing refinement and validation activities.

### Comment

**B-59.** "...We would suggest that, at a minimum, load allocation issues be reserved for later adoption when there is more experience with the use of the models and a better data base from which to work."

### Response

Refinement and verification of the sediment impact zone models and load allocation requirements will occur over a number of years. It is not necessary to "reserve" the concept of load allocation prior to adoption and application of the rule. Refinement and verification work tasks can and should be ongoing and related to continuing development and broad-based implementation of sediment source control and cleanup programs.

### Comment

**B-60.** " While the Department has not required prior landowner approval before permitting a sediment impact zone, there has been no determination that such approval would not be required by the courts... In order to resolve the legal workability issue, the Department should initiate a declaratory judgment action, or at least seek a formal attorney general's opinion, immediately. These regulations should not be adopted until the results of these efforts clearly demonstrate that the sediment impact zone approach is legally viable without landowner approval."

### Response

After careful consideration and discussion with the Office of the Attorney General, Ecology believes that delay of the rule adoption is not justified for this issue. According to the attorney general's advice, the department does not initiate declaratory judgment actions. Additionally, the time constraints involved

with obtaining a formal attorney general's opinion make this option impractical at this time. Ecology acknowledges within the proposed SMS that the approval of a sediment impact zone does not relinquish any existing real estate or proprietary rights or laws.

Ecology believes the proposed SMS should not alter existing authorities of, or provide undue authority to, private or public landowners to mitigate or reverse Ecology decisions on specific discharge permits authorized under provisions of state and federal law.

#### Comment

**B-61.** "Throughout this proposed regulation, the Department seeks to reserve to itself the authority to set additional standards on case-by-case basis. To the extent the Department seeks to set standards, this should be done on the basis of rulemaking with the associated public input...."

#### Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

#### Comment

**B-62.** "...Given the current level of controversy regarding monitoring requirements in newly issued NPDES permits, such guidance should be included in the regulations... Secondly, these monitoring questions are sufficiently important, complex, and technical that they deserve the public scrutiny and input associated with the rulemaking process."

#### Response

Ecology believes it is better to address the complex nature and diversity of monitoring issues for multiple discharger types through development of monitoring guidance implementation documents. Incorporation of numerous, technically complex monitoring requirements would make the proposed SMS far less readable for the regulated community. Of course, as Ecology develops monitoring implementation guidance for the SMS, the recommendations of the implementation committee concerning

incorporation of "generic" monitoring requirements within the rule will be considered.

The Permit Writer's Manual will be subject to public notification requirements of the Administrative Procedure Act. Additionally, NPDES and other permit processes have established public involvement processes for public review and comment on all provisions of the permit including monitoring requirements.

Comment

**B-63.** "...In essence, the proposed regulations just state that where natural levels exceed the standard, the standard shall be considered the natural levels. The fallacy of this approach is that it means a discharger could be liable for any additional contamination above background levels. The regulations should allow some increment of contaminants above the natural background for all of the standards."

Response

The proposed SMS provide for consideration of the nonanthropogenic (natural) contaminant levels in establishing the sediment quality standard and in the source control and cleanup standards. Sediment impact zones may be authorized pursuant to the requirements of the proposed SMS for scenarios where a discharge results or will result in the exceedance of the nonanthropogenically affected sediment quality standards. Similar provisions are recognized for cleanup requirements.

Comment

**B-64.** "...It is assumed that the best management practices language is an attempt to deal with upcoming stormwater management requirements, however, there appears to be no current statutory authority for this standard. In fact, RCW 90.48.520 would suggest the same standards will apply to stormwater as to other discharges...."

Response

Ecology believes it has statutory authority to establish best management practices for any discharge through the Water Pollution Control Act, Chapter 90.48 RCW, and the federal Clean Water Act. **Ecology will provide a definition for the phrase "best management practices" in section 200.**

Comment

**B-65.** "We believe that our AKART statutes would be best interpreted to suggest the requirement for a combination of prevention, control and/or treatment. Obviously, one can not treat that which has been prevented in the first place."

Response

Ecology acknowledges that prevention may pre-empt treatment, but interprets the provisions of Chapters 90.48, 90.52 and 90.54 RCW to require consideration of all known available and reasonable methods of prevention, control and treatment to prevent "pollution" of state waters. Accordingly, the recommended change is not necessary.

Comment

**B-66.** "...While we believe the most recent draft clearly implies that the Table I values are not necessarily ARAR's, we believe there should be a specific statement to this effect in the regulations...."

Response

Ecology understands that the U.S. Environmental Protection Agency's (EPA) authority under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) is used to identify case-by-case applicable or relevant and appropriate requirements (ARARs) for determining site-specific cleanup levels.

In most cases, Ecology would expect EPA to stipulate the Table I values as ARARs for federal cleanup actions in Washington State. Ecology does not have the authority to include such a limitation within the SMS for restricting EPA cleanup authority granted under the CERCLA.

Cleanup levels under the state Model Toxics Control Act (MTCA), Chapter 70.105D RCW, are determined through a process that attempts to identify "applicable" environmental or human health protection values. Though the MTCA process does not generally use the term ARAR, Ecology has determined that the MTCA Cleanup Regulation Chapter 173-340 WAC will include a reference to the SMS as establishing "applicable" cleanup levels for contaminated sediments. Therefore, no purpose is served by inclusion of an ARAR statement within the proposed SMS.

Comment

**B-67.** "...the regulations should be modified to state that the Department does not, in adopting these standards, mean to state an

opinion on their use in establishing natural resource damage."

Response

After careful consideration, Ecology will not include language regarding natural resource damage assessment in the rule.

Ecology acknowledges that the SMS were not developed with the intent to define "injury", "damage", or "natural resource". However, future trustee programs or a court of law may review the rule for its applicability to these definitions and the natural resource damage assessment process in general. Ecology does not want to preclude the rule's utility to future agency programs or case law interpretation.

**Robert S. Burd**

Comment

**B-68.** "These standards have required a substantial effort during the last three years, involving EPA staff and representatives from federal and state agencies, tribes, local governments, ports, private industry, and environmental groups. Issues associated with sediment cleanup and major points of concern to the various affected publics have been openly addressed. The result of these complex negotiations, while not achieving complete consensus, is a flexible and workable standard."

Response

Ecology acknowledges EPA support of the SMS rule.

Comment

**B-69.** "...We see no outstanding flaws that recommend against final adoption of these standards. We endorse Ecology's intent to form an implementation committee to deal with issues that could arise during implementation... We agree with the use of the method that best predicts biological effects (i.e., Apparent Effects Threshold Equilibrium Partitioning) in setting individual chemical criteria for sediments as well as reliance on appropriately sensitive biological tests to confirm the predictions...."

Response

Ecology acknowledges EPA's support of the SMS technical criteria and the proposed SMS implementation committee.

**W. Arthur Noble**



Comment

**B-70.** "We find the proposed rules and the draft EIS supporting them to be inadequate for their lack of scientific and technical justification in terms of public health risk assessment, their failure to designate sediments that have chronic adverse affects on biological resources and their failure to address bioaccumulation and related long-term impacts such as those on human consumption and those on fish or shell fisheries and aquatic birds. Not only is such substantiation mandated by the Puget Sound Water Quality Authority's Management Plan, but it is also required by SEPA."

Response

Ecology agrees that each citizen has a fundamental right to a healthful environment under SEPA. The SMS (SMS) address this issue at the outset of the rule in the authority and purpose section (WAC 173-204-100(2)). The SMS go on to support its purpose of protection of human health and the environment via the minimization of contaminants in any permitted discharge, and the cleanup of contaminated sediments. The specific section on marine sediment human health criteria is reserved in the rule, however, public health impacts have not been neglected. Ecology is currently addressing human health issues from sediment contamination on a case-by-case basis, and will continue to do so until the aforementioned human health criteria development is completed. The final EIS discusses these and other issues identified in the following comment.

Finally, the proposed SMS meet the mandate of the Puget Sound Water Quality Plan and related Clean Water laws. Additionally, please see Ms. Nancy McKay's comments above.

Comment

**B-71.** "We are convinced that standards of such wide-reaching application and profound impact on the health of the Sound and its inhabitants require more meaningful scientific bases than the EIS offers. In light of the SEPA Rules we require that:

- 1) the proposed sediment management standards be scientifically and technically justified in terms of public health risk assessments,
- 2) sediments having chronic adverse effects on biological resources be designated,
- 3) the issue of bioaccumulation be addressed,

- 4) the standards provide for testing for chlorinated dioxins and furans and that the presence of these chemicals be included in both the sediment chemical criteria and the health risk assessments,
- 5) the standards be rewritten to recognize and protect pristine areas, and
- 6) the thrust of the standards not be eventual Soundwide pollution through ever-expanding toxic dumping, but rather a positive movement toward the control and reduction of toxic contamination."

#### Response

The sediment quality standards and the alternatives evaluated in the draft EIS are based on the adverse biological responses of selected organisms exposed to contaminated sediments. By definition, the preferred alternative would allow only minor impacts to biological resources in SIZs or cleanup decisions, and the sediment quality standards would provide for no adverse effects to biological resources over the long term.

Ecology acknowledges that because of the scientific method used, the sediment quality standards and the alternatives evaluated in the EIS are estimates, and not absolute proof, of possible adverse field impacts. However, the specific chemical criteria do serve as hazard assessment indicators, and the biological species tested act as surrogates for the desired level of protection. Thus, while it is not possible to identify the actual impacts associated with each of these alternatives on a Sound wide basis in the EIS, the impacts that may be expected from the alternatives can be compared relative to one another.

Quantitative ecological risk assessment was not used to develop sediment quality criteria that are protective of biological resources because the relationship between the concentration of contaminants in the sediments and concentrations in fish and shellfish is not yet adequately understood. In addition, site specific ecological risk assessments require intensive efforts that are often beyond project capabilities and time frames. For these reasons, Ecology used scientifically-based sediment criteria as discussed in the EIS, and as set forth in the rule.

Risk assessment may be the best approach to determining the impacts to human health as a result of sediment contamination. If a sediment site comes under the authority of the MTCA, Ecology's Toxics Cleanup Program (TCP) will use the sediment cleanup standards as found in the SMS as applicable criteria. However, if Ecology determines that the site poses human health risks, then

the human health risk assessment process found in the MTCA Cleanup Regulation, Chapter 173-340 WAC and a case-by-case evaluation procedure would be used to determine human health risk. If the risk assessment derived values are more stringent than the sediment quality standards, then the more stringent number will supersede. However, if the site does not fall under the authority of the MTCA, then the SMS specifically allow for human health impacts to be evaluated on a case-by-case basis until the human health sediment criteria are established. Ecology plans to begin work on developing human health sediment criteria in cooperation with the Department of Health in 1991.

Several discussions in the draft EIS may have led the reader to conclude that adverse effects to the environment and to human health could be directly determined from the contaminant levels associated with the sediment quality standards and the alternatives being evaluated, without consideration of the related biological effects requirements. As discussed above, this is not accurate and this distinction has been made clear in the final EIS.

#### **D.J. Fogelquist**

##### Comment

**B-72.** "However, we still strongly disagree with the decisions to base a regulation on a single, rather than multiple standards; and to use a controversial system (AET's) for regulatory purposes over the recommendations of EPA's Science Advisory Board. It is unrealistic to establish a universally applicable "no allowable effects" concept for sediments as no activity of society can exist without some impact and change on our surroundings."

##### Response

Multiple standards are an inappropriate answer to the need for flexibility in sediment source control and cleanup programs. Development of multiple standards would require additional time and resources far beyond Ecology's ability. And the contamination levels allowed by multiple standards would not provide the necessary protection of all beneficial uses. Ecology is committed to completion of planned refinement and validation tasks to demonstrate the workability of the sediment impact zone concepts and procedures contained in the proposed SMS.

The commenter does not recognize the national perspective inherent in the recommendations of the Environmental Protection Agency Science Advisory Board (SAB) Sediment Criteria Subcommittee concerning the use of the AET method. Ecology agrees with the

August 13, 1989 response by William Reilly, EPA Administrator, to the SAB's review of the AET method. In his response, Mr. Reilly agreed with the SAB's "endorsement" of the AET method for use on a regional basis and agreed that from the national perspective, a range of innovative techniques, rather than just a single approach, e.g., the AET method, was important. Mr. Reilly concurred that use of the AET approach to develop national sediment criteria "would not be defensible at this time", but also indicated the agency reserved the right to reconsider the use of select AET for broad scale application at a future date pending ongoing studies concerning the use of the method.

Finally, the proposed SMS have been developed consistent with the federal Clean Water Act and the approach used for other environmental media (e.g., surface water quality standards). The SMS identify the minimum conditions (the sediment quality standards) needed to protect the currently designated beneficial uses of the Sound. Both the sediment impact zone and the cleanup decision process introduce flexibility into application of the long term sediment quality goal. Ecology believes these processes provide sufficient flexibility within the proposed SMS to address the "impacts of society."

#### Comment

**B-73.** "...With the threat of ownership liability under cleanup statutes it is unreasonable to assume that an owner of bottom land would permit sediment deposition that could ultimately result in cleanup requirements. Without this permission, how can DOE establish a SIZ? If it is to be based on financial arrangements and assurances provided to the land owner, were these costs considered in the economic evaluation?"

#### Response

Ecology acknowledges within the proposed SMS that the approval of a sediment impact zone does not relinquish any existing real estate or proprietary rights or laws. Ecology believes the proposed SMS should not alter existing authorities of, or provide undue authority to, private or public landowners to mitigate or reverse Ecology decisions on specific discharge permits authorized under provisions of state and federal law. Since the rule does not require landowner approval, the costs of potential financial assurances were not addressed in detail in the economic impact statement.

#### Comment

**B-74.** "The procedures for determining SIZ conditions when multiple sources and/or overlapping SIZ are involved need to be clearly detailed in an implementation document. Stormwater may have an influence on many areas of concern."

Response

Ecology plans to continue ongoing work on refinement and validation of the sediment impact zone models. This work will be incorporated into a guidance document for eventual application by Ecology permit writers. Ecology acknowledges that specific guidance concerning application of the sediment impact zone models to multiple sources in complex urban bay environments including stormwater will be a necessary sediment impact zone guidance issue. Development of consistent load allocation policies and implementation requirements concerning overlapping sediment impact zones will be an ongoing implementation activity after adoption of the SMS. Ecology plans to establish an "implementation committee" for review of the refinement and verification work, and implementation guidance and training documents and activities.

Comment

**B-75.** "An AET based sediment standard should not be used to determine discharge limits if AKART is already in place."

Response

Ecology plans to discuss the relationship of the proposed SMS to all discharges within future implementation guidance documents. Ecology's has conducted preliminary discussions with the SMS Workgroup concerning the relationship of the proposed SMS to all discharges. These discussions identified several key points concerning the relationship of the proposed SMS to discharges at AKART. These points include:

- a) The SMS are not effluent limits but are environmental protection standards which may not be violated. Permit writers may use Best Professional Judgment to identify prevention, control and treatment technologies, including alternate effluent limitations, necessary to prevent a violation of the SMS;
- b) The initial presumption should be that discharges at AKART will not violate or cause a violation of the SMS; and
- c) On a case-by-case basis, the SMS will likely not change the definition of AKART for an industry type, but the standards may require "discharge specific requirements"

for an individual discharger. Over time, AKART may be reinterpreted to incorporate the more stringent requirements represented by any discharger specific requirements.

Comment

**B-76.** "...Any monitoring requirements should be confined to areas in the vicinity of the discharge point and be fully justified by the department as needed to define sediment impacts caused by the discharger."

Response

Based on preliminary results from application of the WASP4 model in the sediment impact zone case studies, Ecology believes that in some cases there will be technical justification for requiring monitoring away from "the vicinity of the discharge point". This is primarily due to technical "fate and transport" considerations necessary when plotting the fate of effluent contaminants in specific receiving-water scenarios.

Ecology plans to address the complex nature and diversity of monitoring issues within the Permit Writer's Manual. As Ecology develops monitoring implementation guidance for the SMS, the recommendations of the implementation committee will be considered. Additionally, Ecology's proposed use of the Permit Writer's Manual as the SMS monitoring guidance document will provide opportunity for public review and comment through the requirements of the Administrative Procedure Act.

Comment

**B-77.** "There are several sections of the regulation that are reserved, or rely on department discretion or stipulated procedures, e.g., 415(1)(a)(ii). Any requirements that are added to the regulation, or used for implementation, should be adopted through APA procedures."

Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

Comment

**B-78.** "We therefore respectfully suggest that the technical staff that developed and understands the purpose and limitations of the regulation be directly involved in the initial implementation decisions regarding permitting, monitoring, cleanup and other requirements."

Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The key work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key issues of implementation and rule interpretation will be directed by the Sediment Management Unit.

Comment

**B-79.** "We support the need for protection of sediments as an important environmental resource and will work with the department staff to implement, and as necessary to modify, the proposed regulation."

Response

Ecology acknowledges this comment.

**Dr. Philip Dorn / Dr. Charles Meyer**

Comment

**B-80.** "The assessment procedures [biological] are difficult to follow and the use of flow charts identifying performance requirements would be helpful. The assessment phase should be tiered into more levels, rather than just two as in the current proposed rules."

Response

Ecology proposes to include informational flow charts within implementation guidance documents to be developed after adoption of the proposed SMS. The Sediment Management Unit will begin a 3-

year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key issues of implementation and rule interpretation will be identified within guidance documents developed by the Sediment Management Unit.

In comment B-88 below, this commenter suggests that the initial designation of sediments should allow for "additional testing to negate possible criterion exceedances from only one round of sampling" and an intermediate tier be provided in the proposed SMS to "allow resampling and preliminary biological testing before requiring confirmatory studies." The implication is that some results may be more trustworthy than others and/or some dischargers would prefer to screen potential test results for compliance with the requirements of the rule.

Provided that the sampling and analysis protocols have been followed and that the resultant data satisfy rigorous quality assurance/quality control requirements, there should be no reason to suspect that some of the data are not valid. There should be no technical reason to give some biological testing results more credence than others. Additionally, in consideration of the costs of monitoring, Ecology believes all monitoring performed should be required to meet the rule's protocol requirements to enable use of the data to interpret compliance with the rule.

#### Comment

**B-81.** "There is considerable subjectivity with regard to the options for compliance testing. The specific steps have much subjectivity, and are very confusing to follow. We recommend that flow charting and concise descriptions are provided for practitioners as well as ample references to technical protocols."

#### Response

Ecology proposes to include informational flow charts within implementation guidance documents to be developed over the next three years after adoption of the proposed SMS.

#### Comment

**B-82.** "The proposed numerical criteria are derived from "flawed" procedures... The AET approach to deriving numerical criteria was reviewed by the U.S. EPA Science Advisory Board Sediment Subcommittee (SAB) and was found to be lacking in many technical areas. The SAB stated in their July 1989 review that "...the AET approach should not be used to develop general, broadly applicable sediment quality criteria. Some major limitations drive this opinion, including the site-specific nature of the approach, its



inability to describe cause and effect relationships, its lack of independent validation, and its inability to describe differences in bioavailability of chemicals to different sediments.'

The committee further recommended that the AET approach not be a stand-alone regulatory tool, and that the technical weaknesses be further worked out. Specifically, the approach suffered from inadequate station replication and lack of paired chemical/toxicity samples. Both of these weaknesses are identifiable in other sections of the proposed regulations."

### Response

The AET approach has undergone several years of interagency review and public comment in the Puget Sound region as well as a formal technical review by the EPA Science Advisory Board (SAB) in 1988.

This process constitutes the necessary validation of the method for the intended use in managing sediment contamination in Puget Sound. The EPA SAB concluded that "The AET values produced from the Puget Sound data appear to work well in Puget Sound...Since AETs are currently being proposed for use as part of a process [the SMS] that involves site-specific biological testing, as opposed to broader, more generic application, this application seems to be consistent with the Subcommittee's recommendation." Ecology selected the AET approach as the currently preferred method for developing sediment quality standards that address adverse biological effects in Puget Sound because of its relatively high reliability in classifying Puget Sound sediments as "impacted" or "not impacted."

Currently, no existing method can provide absolute proof that observed field effects are the result of a specific chemical. In the interest of environmental protection, Ecology has chosen to move ahead on the best information available. The proposed standards are based on a preponderance of evidence of the association between chemical contamination and adverse biological effects. The AET approach for Puget Sound represents the most reliable method to predict the presence or absence of adverse biological effects. To address remaining uncertainty, the rule allows confirmatory biological testing to override sediment classifications based on numerical criteria alone.

The reliability of the AET has been assessed using a large database comprising samples from 13 Puget Sound embayments (all biological indicators were not available in all embayments). In at least 85 percent of the available samples for each biological indicator, the approach either correctly classifies as "impacted" samples that exhibit adverse biological effects, or correctly classifies as "not impacted" samples that do not exhibit adverse biological effects. In addition to its reliability in classifying sediments, the AET approach can be used to provide sediment

quality values for the greatest number and the widest range of chemicals of concern in Puget Sound. The approach also incorporates the widest range of biological indicators that are directly applicable to sediment conditions.

In order for the numerical criteria to be used to measure and/or evaluate projects and proposals from outside the agency, the Administrative Procedure Act requires their codification as a rule. Adoption of the sediment values in a rule is needed to prevent unpredictable, unenforceable, inconsistent and possibly unreliable regulatory and management practices which can result by use of values as "guidelines".

Values for chemicals are adjusted as feasible to take into account established relationships concerning bioavailability (i.e., concentrations of non-polar organic chemicals are normalized to organic carbon content). In addition, Section 173-204-310 (Sediment quality standards designation procedures) contains procedures for designating surface sediments based on confirmatory biological testing (including benthic infaunal abundance). Because biological testing is a more direct method of assessing sediment toxicity, biological testing results outweigh the numerical criteria for designating sediments. These procedures have been incorporated to allow bioavailability to be addressed on a site-by-site basis. Chemical criteria are included in the rule to streamline the sediment designation process and to minimize the economic impacts of testing requirements.

#### Comment

**B-83.** "The numerical criteria are not correctly derived from 1988 AET values.... Using the lowest of the four AET values as reflected in Table I is not appropriate for the "first tier" initial designation (WAC 170-204-310(1)(a)(b)[sic]). This would cause unnecessary expense if the criteria were exceeded and no toxicity were observed in the confirmatory tests."

#### Response

The proposed SMS have been developed consistent with the federal Clean Water Act and the approach used for other environmental media (e.g., surface water quality standards). The criteria are defined based solely on scientific considerations relative to interpreting the sediment quality goal of no acute or chronic adverse effects on biological resources or significant threats to human health. To establish sediment quality standards that are less stringent than the no adverse effects goal, would necessarily compromise protection of beneficial uses (i.e., environmental and human health).

Cost considerations should only enter during the application of the criteria. Ecology has overtly considered cost in establishment of the implementation criteria for source control and cleanup actions, i.e., the Sediment Impact Zone maximum, the Cleanup Screening Level, and the Minimum Cleanup Level. Please see the responses in Parts D and E concerning these cost considerations.

Comment

**B-84.** "There is not [sic] indication of variance or uncertainty in the criteria proposed in Table I and II to allow a range of acceptable sediment chemical concentrations...."

Response

The size and distribution of the total data set has an effect on the uncertainty associated with each AET value; there is less uncertainty associated with an AET value based on many observations than an AET value based on few observations. For this reason, AET values have been and will continue to be updated as a larger database becomes available (Barrick et al. 1988). Uncertainty ranges for AET values, defined as the concentration range from two or three non-impacted stations below the AET to one biologically impacted station above the AET have been evaluated based on statistical classification arguments (Tetra Tech 1986). For the purposes of setting sediment management standards, Ecology believes that the use of a single protective value, rather than a range of values, is most appropriate.

Comment

**B-85.** "...It would appear in concept, the benthos would be the test most representative of a true ecological effect, and should be the principal concern. Rather than using the lowest AET value, the benthic AET value would be more reasonable for screening evaluations."

Response

While it is generally agreed that evaluation of effects on benthic infauna may be considered the test most representative of a "true ecological effect," it is sometimes difficult to discriminate effects that may be attributable to chemical contaminants because of the variability inherent in natural communities. Benthic reference areas are selected to represent the closest possible

match for comparisons with a site of interest, but it is impossible to adequately control all factors (e.g., sediment physical and chemical characteristics, predation, competition, natural disturbance, etc.) that may influence benthic communities in situ. This is to be contrasted with laboratory bioassays, where it is possible to control many of the exposure variables (e.g., temperature, salinity, light regime, exposure period, etc.). Therefore, it is considered more environmentally protective to base decisions on multiple biological indicators rather than to select any single indicator as representative of "true ecological effects."

The four biological tests for which AET values have been developed represent a range of biological responses. Using the lowest AET value is believed to be the most environmentally protective approach because among the four tests, some are more sensitive to certain types of contaminants than are others. For some chemicals, the benthic AET may be the lowest (i.e., most sensitive), while for others, one of the three bioassays may yield the lowest AET value. Some of the organisms used in these tests are more sensitive to metals, while others are more sensitive to organic contaminants. While there is a certain appeal to using the benthic effects AET because it would presumably represent a response in the "real world," the three bioassays are believed to represent more subtle adverse effects that may not be expressed in a community-wide analysis, especially when the natural variance of benthic communities is considered. Hence, it is considered appropriate to use the lowest of the four AET values for establishment of the Sediment Quality Standards.

#### Comment

**B-86.** "The area-weighted averaging procedure is not justified and confusing. The use of the area-weighted averaging procedure is defined but may not be appropriate. The use of a single contaminant concentration to represent the entire area of a station disregards the potential for sample heterogeneity.... Replicate station samples should be collected to determine compliance to screening criteria (that have been modified as recommended)...."

#### Response

After consideration of comments received on the proposed SMS, Ecology has removed the concept of area-weighted averaging. The final rule will be modified to simply require averaging of the three highest contaminated stations (for chemical contaminants) and comparison to the appropriate screening levels.

The sampling density and replication typically performed for

sediment chemistry surveys are insufficient to support a more sophisticated approach, such as krieging, that would associate a measure of uncertainty with each contaminant concentration for a station. Additionally, more intensive monitoring requirements to support the commenter's suggestion would unnecessarily increase the costs to both Ecology and the regulated community.

Comment

**B-87.** "Sampling and testing standards are arbitrary. The section on sampling and tests standards WAC 173-204-600 (3) states that procedures should be those in the "Puget Sound protocols...and/or other methods approved by the department". Information on how to obtain such protocols should be included. It is not clear in WAC 173-204-315 what specific protocols are to be used for biological testing nor are references provided."

Response

The Puget Sound Protocols referred to in WAC 173-204-600(3) are defined in WAC 173-204-200(17). The Puget Sound Protocols are available in looseleaf notebook form from the U.S. EPA, Region 10, and are free of charge to the requestor. The chapters in the Protocols are periodically updated; the chapter dealing with bioassay protocols is currently undergoing revision and should be available in the near future. All holders of the Protocols are automatically provided with updates as they become available.

The Puget Sound Protocols are intended to establish the test procedures for most chemical and biological tests identified within the proposed SMS. The Puget Sound Protocols have been developed to provide well-defined and consistent methods for sampling and analyzing environmental data. The protocols have been reviewed and evaluated by regional scientists from government agencies, consulting firms, and academic institutions. The Puget Sound Protocols are also available from Ecology.

Comment

**B-88.** " Designation procedures should incorporate additional tiers for assessment. An intermediate tier between initial designation and the confirmatory biological tests should be included. The initial designation should allow for additional testing to negate possible criterion exceedances from only one round of sampling. A second tier should allow resampling and preliminary biological testing before requiring confirmatory studies."

Response

Please see the response to comment number B-80 by Drs. Dorn and

Meyer above.

Comment

**B-89.** "Selection of reference sediments may not be possible for all sites...."

Response

Ecology recognizes that it may not always be possible to find a reference area that exactly matches a study area in all characteristics with the exception of chemical contamination. However, it is unlikely that it will "often be impossible to find an appropriate reference area." Ecology has expended considerable effort in identifying reference areas for a variety of sediment types, and we expect the locations of these areas and performance standards for evaluating the suitability of sediments from those areas for use as reference sediments will be specifically incorporated into the SMS in the future.

Comment

**B-90.** "Criteria for complying to the sediment impact zone should be tiered as in the "designation" procedures. The numerical criteria for compliance should be reevaluated as stated in above comments regarding the sediment quality standards development. A first tier should allow chemical compliance screening, followed with a second tier for biological testing."

Response

The SMS rule does allow biological testing results to override chemical test results when evaluating compliance with SIZmax requirements. However, model limitations may require increased reliance on chemical data for source control decisions.

Also, please see Ecology's response to earlier comments by Drs. Dorn and Meyer on the numerical criteria development.

Comment

**B-91.** "Biological performance criteria for impact zone assessment or cleanup standards are not significantly different from "confirmatory" testing for initial site designation.... There is essentially no difference between these sets of criteria when potential test variability is considered. The criteria should require greater than 25% for confirmatory, and greater than 50% for impact zone assessment, and greater than 75% for cleanup standards. Similar differences should be designated for the other biological performance criteria."

### Response

The allowable percent mortalities in the amphipod bioassay referred to by the commenter are not defined in the same way. In confirmatory testing, the test sample would be determined to have an adverse effect on biological resources if it caused a significantly higher mortality than did the reference sample, and if the absolute mortality exceeded 25 percent. The performance standard for the amphipod bioassay allows for up to 25 percent mortality in the reference sediment bioassay. However, in a case where the reference sediment resulted in such a high response, the test sediment would essentially not be allowed any mortality that was significantly greater than that in the reference sediment bioassay (i.e., even if the mortality were significantly higher than that in the reference sediment, it could be no higher than 25 percent in an absolute sense, not relative to that in the reference sediment bioassay).

In both the sediment impact zone and cleanup levels testing, the test sample would be judged to exceed the respective criteria if it caused a significantly higher mortality than did the reference sample, and if the test mean mortality was greater than 30 percent higher than the reference mean mortality, on an absolute basis. Hence, the allowable mortality in the test sediment could range from a minimum of 30 percent (i.e., when the reference mean mortality was 0 percent) to a maximum of 55 percent (i.e., when the reference mean mortality approached 25 percent). This is potentially more lenient than the 50 percent criterion recommended by the commenter. For reasons explained in the EIS, it is considered appropriate that the SIZmax, CSL, and MCUL be defined by the same criteria. Therefore, a higher criterion for the cleanup levels than for the sediment impact zones is not considered appropriate.

For both the larval and Neanthes bioassays, higher responses are allowed in the sediment impact zone and cleanup levels testing than in confirmatory testing. In the case of the benthic infauna test, the criterion for an unacceptable depression in abundance of a major taxon is greater than or equal to 50 percent both in the confirmatory testing and in the sediment impact zone and cleanup level testing. However, in the former case, such a depression must not occur in any of the three major taxa, while in the latter case, such a depression is allowed in one of the three major taxa, but must not occur in two or more of the major taxa. Hence, there are appreciable differences in the severity of allowable impacts between the confirmatory testing and the sediment impact zone/cleanup levels testing.

### Comment

**B-92.** "Regulation of NPDES discharges based upon AET-derived sediment criteria is indefensible. As stated above, the SAB pointed out that there is no cause-effect relationship in the AET-derived sediment criteria values. Such relationship is assumed when using criteria to determine specific concentration or load limits for NPDES discharges as per WAC 173-204-400 (6) (7)."

Response

Ecology has conducted preliminary discussions with the SMS Workgroup concerning the relationship of the proposed SMS to all discharges. These discussions identified the application of the sediment impact zone requirements to new and existing discharges, which meet or don't meet AKART. Several key points concerning the relationship of the proposed SMS to discharges at AKART were identified and include:

- a) The SMS are not effluent limits but are environmental protection standards which may not be violated. Permit writers may use Best Professional Judgment to identify prevention, control and treatment technologies, including alternate effluent limitations, necessary to prevent a violation of the SMS;
- b) The initial presumption should be that discharges at AKART will not violate or cause a violation of the SMS; and
- c) On a case-by-case basis, the SMS will likely not change the definition of AKART for an industry type, but the standards may require "discharge specific requirements" for an individual discharger. Over time, AKART may be reinterpreted to incorporate the more stringent requirements represented by any discharger specific requirements.

**Pertinent to comments made by Mr. Romberg above, Ecology has decided to include a clarification statement within the proposed rule stating that the sediment criteria and sediment impact zones are not considered to be "effluent limits" pursuant to federal discharge permits.**

Currently, no existing method can provide absolute proof that observed field effects are the result of a specific chemical. In the interest of environmental protection, Ecology has chosen to move ahead on the best information available. The proposed standards are based on a preponderance of evidence of the association between chemical contamination and adverse biological effects. The AET approach for Puget Sound represents the most reliable method to predict the presence or absence of adverse



biological effects. To address remaining uncertainty, the rule allows confirmatory biological testing to override sediment classifications based on numerical criteria alone.

The use of modeling and a preponderance of evidence approach, in addition to establishment of a "clear demonstration" link to the source provides an appropriate agency position for initiating source control actions. Ecology plans to detail the relationship of the proposed SMS to all discharges within future implementation guidance documents.

**Thomas L. Aldrich**

Comment

**B-93.** "Attached to this set of comments is a paper entitled "Comments on Apparent Effects Threshold (AETs)" prepared by Battelle Ocean Sciences in June of 1989 (Attachment 2).... As that document demonstrates, the AET numbers set forth in Tables I, II, and III, by virtue of the process by which they were determined, are unreasonably conservative...."

Response

Please see Ecology's response to comment B-53 by Daniel Syrdal above.

Comment

**B-94.** "We urge Ecology to revisit the use of the AETs, particularly in light of the comments presented in the attached Battelle paper. At a minimum, Ecology should revise the AET numbers to ensure that they are not overly conservative and truly reflect a threshold over which adverse effects will always be encountered."

Response

The AET approach has undergone several years of interagency review and public comment in the Puget Sound region as well as a formal technical review by the EPA Science Advisory Board (SAB) in 1988.

This process constitutes the necessary validation of the method for the intended use in managing sediment contamination in Puget Sound. The EPA SAB concluded that "The AET values produced from the Puget Sound data appear to work well in Puget Sound...Since AETs are currently being proposed for use as part of a process

[the SMS] that involves site-specific biological testing, as opposed to broader, more generic application, this application seems to be consistent with the Subcommittee's recommendation." Ecology selected the AET approach as the currently preferred method for developing sediment quality standards that address adverse biological effects in Puget Sound because of its relatively high reliability in classifying Puget Sound sediments as "impacted" or "not impacted."

The reliability of the AET has been assessed using a large database comprising samples from 13 Puget Sound embayments (all biological indicators were not available in all embayments). In at least 85 percent of the available samples for each biological indicator, the approach either correctly classifies as "impacted" samples that exhibit adverse biological effects, or correctly classifies as "not impacted" samples that do not exhibit adverse biological effects. In addition to its reliability in classifying sediments, the AET approach can be used to provide sediment quality values for the greatest number and the widest range of chemicals of concern in Puget Sound. The approach also incorporates the widest range of biological indicators that are directly applicable to sediment conditions. To further compensate for any missing reliability, the standards also provide for direct biological testing of sediments to confirm or override the predictions of chemical criteria.

In order for the numerical criteria to be used to measure and/or evaluate projects and proposals from outside the agency, the Administrative Procedure Act requires their codification as a rule. Adoption of the sediment values in a rule is needed to prevent unpredictable, unenforceable, inconsistent and possibly unreliable regulatory and management practices which can result by use of values as "guidelines".

#### Comment

**B-95.** "Ecology should also revisit the extensive reliance on reference areas contained in these regulations.... In many cases, it will be difficult, if not impossible, to find a reference area that is both uncontaminated and meets all of the particularities of the target sediment."

#### Response

Ecology recognizes that it may not always be possible to find a reference area that exactly matches a study area in all characteristics with the exception of chemical contamination. However, it is unlikely that it will "often be impossible to find an appropriate reference area." Ecology has expended considerable effort in identifying reference areas for a variety of sediment

types, and we expect the locations of these areas and performance standards for evaluating the suitability of sediments from those areas for use as reference sediments will be specifically incorporated into the SMS in the future.

Comment

**B-96.** "Instead of such total reliance on reference area comparisons, Ecology should be prepared to rely on the best scientific judgment based upon a combination of factors, including how benthic infauna abundance and diversity in the target area compares to what would reasonably be expected in such an area...."

Response

Please see Ecology's response to the preceding comment.

If one were to place less reliance on reference area comparisons, it is difficult to see how best scientific judgment could be brought to bear on the issue of assessing "how benthic infaunal abundance and diversity in the target area compares to what would reasonably be suspected in such an area." The only way to form an opinion about the benthic community that could be expected to inhabit an area is by comparison to other similar habitats, recognizing that they may not be exactly alike in all respects. In most cases, however, it is likely that a sufficiently similar environment can be found to serve as a reference area. The SMS rule also allows a laboratory biological assessment of potential chronic effects that would not require a field benthic study.

Comment

**B-97.** "...While Ecology can reserve for future rule-making subjects not covered by these regulations such as freshwater sediment standards, Ecology cannot through this rule-making establish for itself the ability to set "standards" on an ad hoc case-by-case basis.... Therefore, all references in this regulation to Ecology's reserving the right to establish standards on a case-by-case basis in the future should be deleted."

Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a

placeholder for future rule-making.

Comment

**B-98.** "The concept of monitoring of sediment runs throughout this regulation....Ecology should ensure that the requirements being placed in these NPDES permits are consistent with, and will fulfill, the requirements of this proposed regulation."

Response

To-date, Ecology's Sediment Management Unit has coordinated with agency permit writers on a case-by-case basis concerning monitoring to implement existing guidance concerning protection of sediment quality. Ecology plans to address the complex nature and diversity of monitoring issues within the Permit Writer's Manual.

The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training on monitoring and other rule technical and procedural issues.

Comment

**B-99.** "Somewhere in this proposed regulation, Ecology should specifically state that nothing in the regulation is meant to preclude consideration of the various major types of sediment remediation now being normally considered by federal and state regulatory agencies. These alternative forms of remedial action include in-place capping, deepwater disposal, nearshore disposal, intertidal disposal, and upland disposal...."

Response

Although we agree that the proposed SMS are not intended to preclude consideration of any type of sediment cleanup, Ecology believes the cleanup study section, 560(4)(f), adequately defines the limitations for consideration and/or selection of any cleanup alternative. Specific reference to the common forms of cleanup action would not provide any clarification concerning the intent or application of the rule. Additional guidance on selection of cleanup actions will be developed via implementation actions.

Comment

**B-100.** "... The regulation should be reviewed and revised with an eye to establishing a maximum degree of flexibility in decision-making."

### Response

Ecology believes there is a delicate balance in rulemaking to ensure that the environmental goals and objectives of the rule are reachable without sacrificing the agency's flexibility for implementing mandated program administration functions within the rule. Likewise, Ecology's concern for ensuring flexibility also extends to consideration of the regulated community's needs to effect compliance with the spirit and the letter of adopted rules and authorizing legislation.

Ecology's efforts with the SMS Workgroup during language review of the proposed SMS focused on "flexibility" issues. Ecology's intent has always been to maximize flexibility while maintaining the integrity of the rule. During future reviews and updates of the adopted SMS, Ecology invites comment concerning specific revisions of the rule which will meet the intent but provide additional needed flexibility to "get the job done."

### Comment

**B-101.** "... Our research has not revealed any source of statutory authority for placing "best management practices" requirements as an adjunct to AKART. The phrase "best management practices" should be deleted."

### Response

Ecology believes it has statutory authority to establish best management practices for any discharge through the Water Pollution Control Act, Chapter 90.48 RCW, and the federal Clean Water Act.

**Ecology will provide a definition for the phrase in section 200, Definitions.**

### Comment

**B-102.** "Finally, as a general comment, we urge Ecology to consider simplification of the regulations as much as possible. These regulations will apply to many middle- and small-sized businesses, as well as major industries. As a result, they should be in a form that are readable, workable, and easily understandable by the vast majority of the population.... We urge the Department to consider revising the regulations to make them shorter and more easily understandable."

### Response

Ecology understands the need for the regulated community to be able to read and understand the proposed SMS. The SMS Workgroup effort focused a good deal of attention on language clarity and readability. While acknowledging readability as a goal, Ecology also understands that the proposed SMS incorporate a very new and complex technical subject. Ecology believes complete elimination of these technically complex issues from the rule is impossible. A major effort of the proposed SMS implementation program will be to provide guidance documents which will enable interested parties to better understand the subject matter of the rule. During future efforts to review and modify the rule, Ecology will certainly consider specific suggestions to enhance the readability of the rule.

**Richard D. Ford**

Comment

**B-103.** "At the outset, we want to express our appreciation to the Washington State Department of Ecology ("Ecology") for convening the Work Group this spring to address and try to resolve rule policy and language issues. Substantial improvements were made in the proposed rule through the Work Group process. These improvements include, among others:

- Not requiring landowner approval of sediment impact zones;
- Allowing more flexibility to define cleanup levels and sediment impacts above the "no adverse effects" level;
- Defining maximum contamination levels on the basis of biological effects and allowing biological testing to confirm chemical testing results;
- Allowing flexibility in the point of compliance for stormwater and other discharges;
- Defining cleanup sites at the end, rather than the beginning, of the investigatory process;
- Expressing Ecology's commitment to ongoing validation and refinement of the rule;
- Allowing the use of alternate technical methods to replace specific technical methods required under the rule; and

- Removing needless ambiguity from rule language. As a result, the proposed rule is easier to understand and more workable in practice than the earlier drafts."

#### Response

Ecology acknowledges this comment.

#### Comment

**B-104.** "...As you know, the proposed final rule is the first attempt by any state or federal agency to set uniform criteria for sediment quality. It sets a "no adverse effects" goal for Puget Sound sediments. This provides a laudable long-term goal and good general direction for sediment quality, but it does not provide a practical or achievable standard for individual discharges or cleanup given current technology...."

#### Response

The proposed SMS have been developed consistent with the federal Clean Water Act and the approach used for other environmental media (e.g., surface water quality standards). That is, the SMS identify the minimum conditions (the sediment quality standards) needed to protect the currently designated beneficial uses of Puget Sound. To establish sediment quality standards that are less stringent than the no adverse effects goal would necessarily compromise protection of beneficial uses.

The SMS are not effluent limits, but are environmental protection standards. Permit writers may use Best Professional Judgment to identify prevention, control and treatment technologies, including alternate effluent limitations, necessary to prevent a violation of the SMS.

Ecology's case studies addressed the potential for discharges to cause exceedance of the sediment quality standards (i.e., to need a sediment impact zone). These studies indicated that the achievability of meeting the sediment quality standards was independently linked to both the discharge quality and the receiving-water physical and chemical characteristics. These studies predicted that two existing wastewater discharges currently receiving secondary treatment would not cause a violation of the sediment quality standards. While these results are preliminary, Ecology believes and has premised the sediment impact zone process on the assumption that discharges at AKART will not generally cause a violation of the sediment quality standards.

Finally, Ecology believes there is no outstanding technical question about whether cleanup actions can achieve the long term goal, i.e., the sediment quality standards. Current dredging, capping and disposal technologies are considered adequate to achieve the sediment quality standards in most cases. Ecology acknowledges the real cleanup question is practicality, which was the subject of two externally advisory workgroups on the development of the SMS. To provide greater flexibility in meeting the long-term sediment quality goal, Ecology agreed with the recommendations of the SMS Workgroup to include considerations of engineering feasibility, cost, and time (natural recovery) in the selection of the cleanup standard. With the modification of the cleanup standards to include these flexibility factors, Ecology believes the cleanup standards are both achievable and practical while still protecting the environment and human health.

#### Comment

**B-105.** "We agree with Ecology that sediment quality criteria should be defined, if at all, on the basis of biological rather than chemical effects. This change is a substantial improvement over earlier versions of the proposed rule, and recognizes the well-documented practical and theoretical limitations of the Apparent Effects Threshold ("AET") approach.... "This change, however, only lessens one of the fundamental problems associated with the proposed rule: the use of biological tests to set numerical chemical criteria without adequate validation. Other problems are associated with using the biological tests that underlie the AET approach in order to make important regulatory decisions regarding sediment quality. These problems include: (1) lack of validation of the underlying biological tests: and (2) failure to adequately specify in the proposed rule the procedures that must be used in biological testing, including the procedures for selecting "reference" samples...."

#### Response

The AET approach has undergone several years of interagency review and public comment in the Puget Sound region as well as a formal technical review by the EPA Science Advisory Board (SAB) in 1988.

This process constitutes the necessary validation of the method for the intended use in managing sediment contamination in Puget Sound. The EPA SAB concluded that "The AET values produced from the Puget Sound data appear to work well in Puget Sound...Since AETs are currently being proposed for use as part of a process [the SMS] that involves site-specific biological testing, as opposed to broader, more generic application, this application seems to be consistent with the Subcommittee's recommendation." Ecology selected the AET approach as the currently preferred



method for developing sediment quality standards that address adverse biological effects in Puget Sound because of its relatively high reliability in classifying Puget Sound sediments as "impacted" or "not impacted." The SAB also provided specific support to the biological testing methods used in the SMS rule.

The reliability of the AET has been assessed using a large database comprising samples from 13 Puget Sound embayments (all biological indicators were not available in all embayments). In at least 85 percent of the available samples for each biological indicator, the approach either correctly classifies as "impacted" samples that exhibit adverse biological effects, or correctly classifies as "not impacted" samples that do not exhibit adverse biological effects. In addition to its reliability in classifying sediments, the AET approach can be used to provide sediment quality values for the greatest number and the widest range of chemicals of concern in Puget Sound. The approach also incorporates the widest range of biological indicators that are directly applicable to sediment conditions. To further compensate for any missing reliability, the standards also provide for direct biological testing of sediments to confirm or override the predictions of chemical criteria.

Concerning the comment on identification of biological testing requirements, please see Ecology's response to a similar comment made by Drs. Dorn and Meyer (B-87).

Concerning the comment on identification of reference areas, please see Ecology's response to similar comments by Drs. Dorn and Meyer (B-89) or Thomas Aldrich (B-95).

#### Comment

**B-106.** "There are a number of technical concerns with the underlying biological test methods. These include the following, among others: a failure to adequately account for other variables such as grain size and conventional pollutants in assessing test results; and the inappropriateness of comparing abundances of total infauna or major taxa between potentially impacted stations and reference stations where the benthic community structure (species composition and dominance/diversity) at the reference stations does not resemble that at the potentially impacted stations...."

#### Response

It is recognized that factors such as grain size and conventional pollutants may affect the biological tests used in confirmatory testing. It is therefore important that there be as close a match as possible between the sediments from the reference area and the

area being tested. The department has expended considerable effort in identifying appropriate reference areas for a wide range of sediment conditions<sup>7</sup> and expects to finalize reference area performance standards to be incorporated into the rule.

Additionally, please see Ecology's response to similar comments on reference areas by Drs. Dorn and Meyer (B-89) or Thomas Aldrich (B-95).

In the absence of reference area comparisons, there would be no basis for assessing the benthic community that would likely exist in a test area in the absence of anthropogenic factors. Although it is unlikely that a perfect reference area can be found for each test area, it is possible to identify reference areas that are similar to test areas with respect to most of the major variables known to influence the characteristics of benthic communities (e.g., season, salinity, depth, sediment characteristics). Reference areas therefore provide the best available estimates of natural benthic communities. The reference area approach has a substantial historical precedent for impact assessment and provides clear, objective, testable hypotheses that are easily understood by most interested parties, both technical and nontechnical.

#### Comment

**B-107.** "Given these lingering technical concerns, we continue to urge that the approach taken in the proposed rule to establishing sediment quality criteria be subject to further peer review, by an independent scientific body such as the Washington Scientific Advisory Board, before Ecology promulgates the final rule. This will ensure that Ecology has a sound scientific basis for its standards."

#### Response

The AET approach has undergone several years of interagency review and public comment in the Puget Sound region as well as a formal technical review by the EPA Science Advisory Board (SAB) in 1988.

In November 1988, Ecology sought the advice of the Ecology (Washington) SAB on the same issues being reviewed by the Environmental Protection Agency SAB. This request was made in order to obtain a "second opinion" on the technical method and to address requests from our external policy advisory group. At that

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<sup>7</sup> "Interim Performance Standards For Puget Sound Reference Areas" by Robert A. Pastorok, et. al., published by the Washington Department of Ecology, June 1989.

time, Ecology submitted nine technical questions related to the sediment standards for review by the SAB. These questions included issues associated with the AET approach to developing sediment quality values, human health risk of sediment contamination, and ranking of contaminated sediment sites. The Ecology SAB decided that given the EPA SAB review, the extent of the technical documentation, and the more limited "marine ecological" knowledge of the Ecology SAB, that they would not undertake a detailed review of the proposed SMS. Rather, the SAB chair asked individual members to provide any comments to Ecology on the submitted documents and review questions. Additionally, the SAB requested an opportunity to review any future human health sediment criteria. Ecology has made two additional presentations to the Ecology SAB in December 1989 and November 1990.

Ecology plans to seek the review of the Ecology Science Advisory Board established under the MTCA on future technical issues such as human health assessment procedures as we proceed with implementation and refinement of the SMS.

Comment

**B-108.** "The proposed rule fails to adequately specify in the proposed rule the testing procedures that must be used in conducting the biological tests...."

Response

The proposed SMS contain the requirement to conduct all sampling and testing and interpretation per the Puget Sound Protocols and/or other methods approved by the department in section 600. **Ecology will add references to this requirement earlier in the text of the rule to ensure adequate specification of the required protocols.**

Comment

**B-109.** "The proposed rule requires that biological test results be statistically compared to reference samples.... It does not explain, however, where this reference data may be found or what reference data may be appropriate for comparison to biological test data from a specific potentially impacted station or site. Thus, it is impossible to know how to conduct biological testing given the existing information found in the proposed rule. Ecology should include procedures for selecting appropriate reference sediment samples...."

Response

Reference data do not consist of previously collected data

appropriate for comparison with newly collected data. Instead, the reference data are to be generated during the biological testing. In the conduct of all of the bioassays within the proposed SMS, it is required that reference area sediment be collected and analyzed simultaneously with the test sediment. The proper use of reference sediments in these bioassays is described in detail in the bioassay chapter of the Puget Sound Protocols. In the assessment of benthic infaunal abundance, it is important that the communities inhabiting reference and study areas be sampled as nearly simultaneously as possible, because it is important that the reference area serve as a control for seasonal or interannual differences that could not be accounted for in comparisons only with historically collected data. Ecology has expended considerable effort in defining suitable Puget Sound reference areas for a wide range of sediment conditions. It is expected that the locations of suitable reference areas and performance standards for assessing the appropriateness of candidate reference sediment samples will be incorporated into the SMS.

#### Comment

**B-110.** "... We question, however, whether the maximum sediment contamination levels allowed under the Puget Sound Dredged Disposal Analysis ("PSDDA") should dictate the cleanup screening level or the maximum allowable sediment contamination level within a sediment impact zone especially since the PSDDA levels are guidelines only and have not been formally promulgated under any regulatory authority. "The final rule should allow more flexibility in setting maximum sediment contamination levels for sediment impact zones and cleanup screening levels. We suggest that the cleanup screening level and maximum allowable sediment contamination level within a sediment impact zone be a flexible criterion, with the potential for site-specific exceedance based on a site-specific risk assessment. Setting flexible rather than inflexible maximum allowable sediment contamination levels would avoid unnecessary cleanups in areas where little or no biological impacts have been demonstrated on established local communities. It would also avoid environmental impacts created by unnecessary cleanup actions such as dredging."

#### Response

In keeping with the recommendations of the SMS Workgroup, Ecology developed the proposed SMS so that the sediment impact zone maximum (SIZmax) level, cleanup screen level (CSL) and the minimum cleanup level (MCUL) were based on biological effects. The rule enables chemical screening of sediments initially with backup biological testing to confirm the level of effects in the test sediment relative to the SIZmax, CSL or MCUL. This screening

procedure is similar to the sediment designation procedures for the sediment quality standards.

Ecology agrees with the "regulatory beauty" approach to establishing the SIZmax/CSL/MCUL levels. This approach would make dredging, source control and cleanup programs compatible by establishing a common biological effects level for the separate program regulatory decisions. To provide a consistent sediments designation approach within the proposed SMS, Ecology has included chemical concentration levels which define the selected biological effects level. Within the environmental and economic impact statements prepared for adoption of the proposed SMS, Ecology has identified the PSDDA nondispersive, unconfined open-water disposal site level ("Site Condition 2"), as the preferred alternative to establish the SIZmax, CSL and MCUL. The current legal status of the "PSDDA guidelines" was considered in the environmental impact statement prior to Ecology's decision to use Site Condition 2 as the preferred alternative. While only "guidelines", the PSDDA levels are used as definitive criteria for Puget Sound dredged material assessment and disposal decisions made by the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, the Washington State Department of Natural Resources, and Ecology.

Ecology also concurs with the consensus recommendation of the SMS Workgroup that a minimum cleanup level should be stipulated within the rule. Ecology believes the proposed rule provides adequate flexibility for consideration of multiple factors in selection of a contaminated sediment site cleanup standard and site-specific remedial action. While consideration of these factors is necessary to successful implementation, cleanup actions must be constrained by a minimum cleanup level to ensure an acceptable level of environmental and human health protection. Ecology's selection of the minimum cleanup level proposed within the rule is based on the evaluation of alternatives included within the related environmental impact statement (EIS).

#### Comment

**B-111.** "The final rule should also allow more flexibility in determining a cleanup standard for individual cleanup sites. We suggest that the final rule not specify a minimum cleanup level. Instead the final rule should only specify the factors that may be considered in determining a site-specific cleanup standard. These factors should include the net environmental effects (including the potential for natural recovery of the sediments over time and the impacts of known and available remediation techniques), cost, and engineering feasibility of the different cleanup alternatives."

#### Response

Ecology supports and the proposed rule currently reflects the results of the SMS Workgroup discussions on enhanced flexibility in setting the cleanup standard at a contaminated sediment cleanup site. The rule currently allows consideration of time (i.e., natural recovery), cost, net environmental impact, and technical feasibility to establish a site cleanup standard within the range defined by the sediment quality standards and the minimum cleanup level (MCUL).

Ecology also concurs with the consensus recommendation of the SMS Workgroup that a minimum cleanup level should be stipulated within the rule. Ecology believes the proposed rule provides adequate flexibility for consideration of multiple factors in selection of a contaminated sediment site cleanup standard and site-specific remedial action. While consideration of these factors is necessary to successful implementation, cleanup actions must be constrained by a minimum cleanup level to ensure an acceptable level of environmental and human health protection. Ecology's selection of the minimum cleanup level proposed within the rule is based on the evaluation of alternatives included within the related environmental impact statement (EIS).

#### Comment

**B-112.** "The final rule should allow dischargers a number of mechanisms to show compliance with sediment impact zone requirements. First, the final rule should explicitly allow dischargers to rebut any inference that sediment impact zone criteria have been exceeded.... The rule needs to clearly state, however, that any inference of non-compliance created by these methods can be rebutted by direct monitoring."

#### Response

Ecology will revise section 415(5) of the rule to specifically allow dischargers to rebut a "clear demonstration" by the department that as a result of an effluent discharge, the discharger violates, shall violate, or creates a substantial potential to violate the sediment impact zone maximum criteria. This revision will allow the discharger the use of the same technical methods enabled for Ecology's clear demonstration, including direct monitoring.

Of course, Ecology will retain discretion approval/denial authority for the discharger's rebuttal. As with all administrative discharge permit decisions made by Ecology, the discharger will retain appeal rights to the Pollution Control Hearings Board for Ecology's decision on the sediment impact zone rebuttal.

Comment

**B-113.** "Second, the final rule should explicitly allow longer schedules for compliance with maximum contamination levels for previously approved long-term remediation plans developed with the Department of Ecology, such as a 20 year STP/CSO facility plan...."

Response

Because facility plans must meet current legislative requirements for addressing maximum practicable reduction, further reduction or acceleration of compliance time frames may not be possible. Ecology considers that sediment impact zones may be issued for POTW and CSO discharges with facility plans (regardless of whether they meet AKART), but they will be subject to all the requirements of the SIZ process in the rule including the SIZmax concentration requirements. Exceedances of the SIZmax may trigger review of the facility plan for compliance with the SMS at the next 5 year update, and SIZ monitoring and maintenance activities per the requirements of the proposed rule. The rule does not constrain the establishment of appropriate compliance time frames for individual discharges.

Comment

**B-114.** "The proposed final rule does not allow for sufficient validation and refinement of the rule before implementation. "For sediment impact zones, this additional validation and refinement should at least include a sensitivity analysis of key model variables, an integration of the WASP4 and CORMIX systems, and an application to the potential problem of load allocation between multiple sources. For sediment cleanups, this additional validation and refinement should at least include a final verification of the ranking system and a screening of the initial site list to ensure consistency with existing information and professional judgment."

Response

Ecology agrees with the need to further refine and verify the sediment impact zone models and site identification and ranking methods, but believes this work will occur over a number of years and is not necessary to complete prior to adoption and application of the rule. Refinement and verification work tasks can and should be ongoing and related to continuing development and broad-based implementation of sediment source control and cleanup programs.

Ecology plans to continue ongoing work on refinement and validation of the sediment impact zone model. This work will be incorporated into a guidance document for eventual application by Ecology permit writers. Ecology acknowledges that specific guidance concerning application of the sediment impact zone models to multiple sources in complex urban bay environments including stormwater will be a necessary sediment impact zone guidance issue. Development of consistent load allocation policies and implementation requirements concerning overlapping sediment impact zones will be an ongoing implementation activity after adoption of the SMS. However, Ecology believes implementation of the modeling approach for sediment impact zone requirements need not wait for the results of this complex site analysis. Ecology plans to establish an "implementation committee" for review of the refinement and verification work, and implementation guidance and training documents and activities.

#### Comment

**B-115.** "...We urge Ecology to follow through on a program proposal that would centralize many of the implementation functions for the rule in the Sediment Management Group for the first three to five years."

#### Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The key work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, key issues of implementation and rule interpretation will be directed by the Sediment Management Unit.

#### Comment

**B-116.** "...We also urge Ecology to make improvements to the current communication process for NPDES permits that would allow for an open dialogue between Ecology and the permittee on matters related to sediment monitoring and sediment impact zone establishment, maintenance and closure...."

#### Response

The communication process currently used by Ecology permit writers



is described in the department's Permit Writer's Manual. It was developed with the assistance of both an internal and external advisory group. This process expressly encourages early communication between the permit writer and permittee to ensure that the draft permits are factually correct. However, to ensure equal public access to permit decisions, the process does not provide for communication on permit conditions until after the draft permit is issued to interested parties. Ecology agrees that improvements to the current communication process need to be developed between permittees, the public, and Ecology. The process contained in the Manual is considered to be an interim process pending future refinement. Ecology's Water Quality Program is currently responsible for improvements to the permit communication process. Revised guidance in the Permit Writer's Manual is scheduled for the end of 1991.

Comment

**B-117.** "...We ask that Ecology incorporate recommendations made in the forthcoming report of the Governor's Efficiency Committee on Ecology's Wastewater Discharge Permit Program into its Sediment Management program."

Response

Ecology plans to incorporate the recommendations of the Governor's Efficiency Commission into the Sediment Management program as applicable. Ecology believes that completing its effort on the current draft "implementation plan" for the SMS will provide for the needed consistency with the recommendations contained in the Efficiency Commission's report. Completion of the implementation plan will identify a schedule for intraagency training and application of sediment source control activities for "major" dischargers first. The draft implementation plan will be submitted to the SMS implementation committee for review and comment before finalization.

Comment

**B-118.** "...The final rule should contain clear language that the sediment quality criteria are not intended to define "injury", "damage", or "natural resource" for purposes of assessing natural resource damages...."

Response

After careful consideration, Ecology will not include language regarding natural resource damage assessment in the rule. Ecology acknowledges that the SMS were not developed with the intent to define "injury", "damage", or "natural resource". However, future

trustee programs or a court of law may review the rule for its applicability to these definitions and the natural resource damage assessment process in general. Ecology does not want to preclude the rule's utility to future agency programs or future case law interpretation.

Comment

**B-119.** "...The AET method is unable to link perceived impacts with chemical concentration levels, and therefore is an inappropriate method for assessing the damage to natural resources...."

Response

Currently, no existing method can provide absolute proof that observed field effects are the result of a specific chemical. In the interest of environmental protection, Ecology has chosen to move ahead on the best information available. The proposed standards are based on a preponderance of evidence of the association between chemical contamination and adverse biological effects. The AET approach for Puget Sound represents the most reliable method to predict the presence or absence of adverse biological effects. To address remaining uncertainty, the rule allows confirmatory biological testing to override sediment classifications based on numerical criteria alone.

Additionally, please see the response to comment B-118 above by Richard D. Ford.

Comment

**B-120.** "The final rule should at least specify the level of monitoring (ranging from low monitoring to high monitoring) that will be required under different circumstances and the types of monitoring studies that may be required...."

Response

Ecology plans to discuss the relationship of the proposed SMS to all discharges within future implementation guidance documents. This discussion will focus on monitoring requirements and application of the sediment impact zone (SIZ) process. Ecology has conducted preliminary discussions with the SMS Workgroup concerning the relationship of the proposed SMS to all discharges. These discussions identified the application of the sediment impact zone process and three levels of monitoring requirements (low, medium and high), to new and existing discharges, which meet or don't meet AKART.

Ecology believes it is best to first finalize decisions on the

complex nature and diversity of monitoring issues for multiple discharger types through development of monitoring guidance implementation documents. As Ecology develops and completes monitoring implementation guidance for the SMS, the recommendations of Ecology's SMS implementation committee will be requested concerning incorporation of "generic" monitoring requirements into the rule.

Comment

**B-121.** "The proposed rule provides Ecology the authority to determine on a case-by-case basis the criteria, methods and procedures for regulating other marine, low-salinity (estuarine) and freshwater sediments.... These criteria, methods and procedures must be adopted in accordance with the Administrative Procedure Act, Ch. 34.05 RCW, before they are applied to regulated parties.'

Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

Comment

**B-122.** "The proposed final rule is unclear on whether the source control standards would apply to stormwater discharges that are not required to obtain an NPDES or state waste permit or to various nonpoint sources of pollution... there are no specific provisions in the source control standards for these types of discharges.... We strongly urge Ecology to clarify this issue in the final rule."

Response

Sediment source control standards, including sediment impact zone requirements, do not apply to stormwater discharges that are unpermitted or otherwise unauthorized by Ecology. During application for a state waste discharge or NPDES permit, previously unpermitted stormwater discharges will be placed on a compliance schedule to meet AKART, and thus become eligible for a sediment impact zone. Unpermitted or unauthorized stormwater discharges will be subject to cleanup requirements as specified in WAC 173-204-500 through 590.

The sediment impact zone definition (section 200, #19) in the proposed SMS includes nonpoint sources as discharges that are eligible for a sediment impact zone within a permit or other formal department authorization. In order to further clarify the application of the source control standards to various nonpoint sources of pollution, additional references will be made in the following sections of the proposed rule. **The definition for "sediment impact zone" will be clarified to apply to permitted or otherwise authorized nonpoint source discharges. References to stormwater and nonpoint discharges will be added at the beginning of WAC 173-204-400, General considerations of Sediment Source Control, and again in WAC 173-204-410(5)(c), Sediment quality and sediment impact zone applicability.**

Ecology has the authority to manage both nonpoint source and groundwater pollution. State waste discharge permits may be required for some discharges not covered by the NPDES program, such as certain agricultural discharges and discharges affecting ground water (RCW 90.48.160). In addition, RCW 90.48.110 gives Ecology regulatory authority over systems which do not result in point source discharges. While permitting of nonpoint sources has not been prevalent in the past, Ecology is moving in that direction with the development of a general permit for marinas and boatyards as one example. The issue of how to manage the aforementioned sources of sediment contamination will be a future development activity for Ecology.

#### Comment

**B-123.** "...It remains difficult, however, to determine exactly what provisions of the proposed source control standards would apply to dredgers. "In practice, this [section 410 (6)] apparently means that a dredger may need to obtain a sediment impact zone for a confined disposal site in the event that the sediments would exceed the PSDDA criteria for unconfined disposal sites (PSDDA sites). "...it remains unclear whether meeting PSDDA site requirements and obtaining a sediment impact zone for the disposal site exempts dredged disposal activities from the general requirements not to cause an exceedance of the "no adverse effects" sediment quality criteria...."

#### Response

Section 410(6) of the SMS rule states that sections 400, 410, and 420 are applicable to dredging activities, and exempts dredging activities from the procedural and technical requirements of section 415. Section 410(6) defers source control requirements for dredging activities to current federal and state guidelines. Thus, while disposal of dredged material that exceeds the sediment quality standards would require a sediment impact zone, the

specific SIZ requirements would be those described in PSDDA or other current guidance documents. In practice, Ecology plans to issue an administrative order establishing the designated PSDDA disposal sites and related conditions as formally authorized SIzs under the SMS. For confined disposal, material exceeding the sediment quality standards will require a SIz, likely to be established through the project-specific water quality certification. The SIz authorization will usually be temporary with specified closure requirements given that "confinement" is the desired end result of the project. For dredging activities, a SIz may be needed in cases where resuspension or excavation causes an exceedance of the sediment quality standards or otherwise worsens existing conditions of the surface sediments.

#### Comment

**B-124.** "The proposed final rule is unclear as to when a discharger must apply for a sediment impact zone. "...Ecology could do so by changing WAC 173-204-415 (2)(b)(ii) to read: 'The person independently identifies, through an evaluation required by Ecology under WAC 173-204-400(2) or (3), that the ongoing effluent discharge... using the procedures of this section' (changed language underlined)."

#### Response

The intent of section 415 (2)(b)(ii) is to acknowledge that dischargers may "independently" identify that a sediment impact zone is necessary without first being required by the department to conduct such an analysis under section 400(2) or (3). In such cases, Ecology believes the discharger should be compelled to apply for a sediment impact zone regardless of the department's requirement to do so. The language of section 415 (2)(b)(ii) will be clarified to stipulate this intent.

Additionally, please see Ecology's response to related comments by Mr. Ford (B-112) and Mr. Romberg (B-20).

#### Comment

**B-125.** "...The proposed rule does not address what sanctions, if any, may be imposed on the discharger if the discharger is required to apply for a sediment impact zone but fails to do so, upon the dredger if its dredging activities cause an exceedance of the "no adverse effects" sediment quality criteria, or upon a person if his or her unpermitted stormwater activities (that are not required to obtain an NPDES or state waste permit) or nonpoint discharge cause an exceedance of the "no adverse effects" sediment quality criteria. "At a minimum, the final rule should state explicitly that permitted dischargers who are using AKART

are in compliance with the Sediment Management Standards until such time as they are required to apply for a sediment impact zone, that dredgers are in compliance with the Sediment Management Standards if they meet PSDDA guidelines and obtain a sediment impact zone for their disposal site, and stormwater dischargers (who are not required to obtain an NPDES or state waste permit) and nonpoint dischargers are in compliance with the Sediment Management Standards until such time as Ecology requires them to obtain a permit or meet certain Best Management Practices ("BMPs")."

#### Response

Enforcement of the proposed standards, similar to current enforcement of the Water Quality Standards, will primarily be through already defined enforcement and penalty mechanisms contained in the Water Pollution Control Act (WPCA), Chapter 90.48 RCW, and the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

**The rule will be modified to include a policy statement in section 130 that identifies enforcement of the SMS shall be taken as necessary pursuant to the pertinent authorizing legislation.**

#### **Parametrix**

##### Comment

**B-126.** "...although the concept of a reference area comparison is highly desirable, the reality of such a comparison is less than satisfactory. In many marine communities, a useful and good reference station can not be found and used validly to test effects."

#### Response

Ecology recognizes that it may not always be possible to find a reference area that exactly matches a study area in all characteristics with the exception of chemical contamination. However, it is unlikely that it will "often" be impossible to find an appropriate reference area." Ecology has expended considerable effort in identifying reference areas for a variety of sediment types, and we expect the locations of these areas and performance standards for evaluating the suitability of sediments from those areas for use as reference sediments will be specifically incorporated into the SMS in the future.

Additionally, please see Ecology's responses to Mr. Aldrich's comment B-96 above.

Comment

**B-127.** "The basic concept of a reference area as a definitive test assumes we know and can measure all the factors the [sic] influence the benthic community inhabiting a site. ...we can not be sure that differences between reference and test sites are due to contamination differences.... Thus it is important to consider reference vs. test site comparisons as a presumptive indicator rather than a confirmatory test."

Response

Please see Ecology's responses to Mr. Aldrich's comments B-96 above. It is also important to note that in situations where a case can be made that an appropriate reference area cannot be found for the benthic infaunal abundance test, the option exists to select as the chronic test one of the bioassays, in which the exact "match" between reference and test sediments is not as critical.

**Dr. David Monroe**

Comment

**B-128.** "...the Sediment Management Standards fail to meet the objectives of the Puget Sound Water Quality Management Plan, Element P2, which directs Ecology to develop and adopt sediment quality standards for identifying and designating sediments that have acute or chronic adverse effects on biological resources, or pose a significant health risk to humans. The Sediment Management Standards also do not meet the objectives of several State and Federal Statutes:

- The State Environmental Policy Act, Chapter 43.21C RCW, which requires that State agencies 'attain the widest range of beneficial uses of the environment without degradation'.
- The Model Toxics Control Act, Chapter 70.105D RCW, which requires Ecology to identify cleanup procedures and standards that are protective of human health and the environment.
- The State Water Pollution Control Act, 90.48 RCW, which contains an antidegradation policy for water quality.
- The Clean Water Act, 42 U.S.C. 1251 et. seq., which

require that no discharge cause or contribute to significant adverse effects on human health, or have unacceptable adverse effects on shellfish beds or fishery areas.

- The Comprehensive Environmental Response, Compensation, and Liability Act, CERCLA 42 U.S.C. 9601 et seq., which defines the basic requirements to be met by cleanup actions as protection of human health and the environment."

#### Response

Ecology agrees that it should "attain that widest range of beneficial uses of the environment without degradation." This issue notably comes from a wide-ranging policy discussion of environmental issues within the State Environmental Policy Act (SEPA). According to the SEPA in WAC 197-11-448(1), the "EIS is not required to...contain the balancing judgment that must ultimately be made by the decisionmakers". Nevertheless, the SMS do cite at the outset of the rule that they are guided by Chapters 90.48 and 90.54 RCW to apply the antidegradation policy of the state.

Ecology recognizes that the development of human health sediment criteria is an important issue and we have established an agreement with the Department of Health to begin development of human health sediment criteria in 1991. For a more extensive discussion of the implementation of human health risk assessment under the purview of the Model Toxics Control Act, please see Ecology's response to comment B-71 by Mr. Noble above.

#### Comment

**B-129.** "An expanded list of 'chemicals of concern' for contaminated sediments in the State of Washington, including chlorinated dibenzodioxins, chlorinated dibenzofurans, and organotin compounds, among others" (should be considered).

#### Response

The sediment quality standards in Table I of the proposed SMS have been included because:

- a) These chemical parameters have been determined to be the best predictors of adverse biological effects in Puget Sound, i.e., addition of other chemical values does not improve Ecology's ability to predict adverse biological effects, and



- b) These chemical parameters are routinely analyzed for and are frequently found above analytical quantitation limits;

Ecology has considered inclusion of other chemicals in Table I including dioxins, furans and organotin compounds. But, due primarily to the reasons above, standards for these and other chemicals were not included. Ecology will consider other chemicals of concern during development of human health standards.

Ecology has expanded the sediment quality standards within the proposed SMS to incorporate "other toxic, radioactive, biological, or deleterious substances" sediment criteria. These sediment quality criteria provide the mechanism to address other chemical compounds that are not listed in the proposed SMS and to address the impacts of unique discharges e.g., net pens, log storage, and marinas, on sediment quality which may affect beneficial resources or human health.

Finally, Ecology believes that risk assessment may be the best approach to determining the impacts to human health as a result of sediment contamination. The rule thus specifically allows for human health impacts to be evaluated on a case-by-case basis until such time as state wide (or, e.g., Puget Sound wide) human health criteria are established. In this manner, significant threats to human health will be avoided. Ecology plans to begin work on developing the human health criteria in cooperation with the Washington State Department of Health in 1991.

#### Comment

**B-130.** "A derivation of Marine Sediment Quality Standards for the expanded list of 'chemicals of concern' which takes into account human health and ecological risks" (should be considered).

#### Response

Ecology plans to begin work on developing the human health criteria in cooperation with the Washington State Department of Health in 1991.

**George Ploudre**

#### Comment

**B-131.** "FEIS should identify possible funding sources available to ports for clean-up and note whether or not State of Washington has or anticipates a financial assistance program for accomplishing

clean-up."

Response

Several funding sources may be available to ports for cleanup activities, including the toxics control account, Washington state revolving funds, and the Centennial Clean Water Fund.

Comment

**B-132.** "Reference: Federal Programs - Page 7-1 - last paragraph. Is a Section 401 certification required for active cleanup if the dredging and disposal do not result in any discharge into navigable waters?"

Response

Ecology currently interprets dredging to constitute a "discharge" pursuant to the federal Clean Water Act, thus requiring a certification even when upland disposal is proposed.

Comment

**B-133.** "Implementation of the sediment management standards will require a very high level of technical expertise and professional competence because of the complexity of the proposed process and its application, as set forth in the DEIS. This should be recognized and perhaps some thought given to a cooperative approach e.g. PSDDA in the technical characterization and subsequent assessments."

Response

Ecology agrees that implementation of the Sediment Management Standards will require technical expertise and training, and will initiate a training program in early 1991 as noted earlier in the responses to similar oral comments. During the time of this training program, consideration will be given to implementing the Standards through a cooperative approach, as suggested by this comment.

Comment

"Improvement in source control, an objective of the sediment management standards, is applauded as this should help reduce the cost of dredging and disposal of contaminated sediments removed from navigation harbors and channels."

Response

Ecology acknowledges the Corps support of source control for sediments.

**C. WRITTEN COMMENTS ON SPECIFIC SECTIONS OF THE SEDIMENT  
MANAGEMENT STANDARDS**

**WAC 173-204-100**

**Subsection (8)**

Comment by Dr. David Jamison

**C-1.** "Sediment contamination is a state wide issue founded to a high degree on highly technical concepts and procedures. Therefore local government should not be allowed to develop their own standards. To do so would create inconsistencies and confusion leading to unnecessary regulation of sediment management with higher costs and unknown environmental consequences. I recommend that the regulations prohibit the institution of local control."

Response

It is not appropriate for Ecology to prohibit local government adoption of ordinances that will increase the protection of the environment and human health. Rather, Ecology's intent within the SMS is to ensure such lawful actions are no less stringent than state law. Due to the technical complexity and current "new" status of Ecology's effort to develop and adopt the SMS, Ecology is not encouraging local authorities to adopt local rules for sediment quality protection at this time. Of course, Ecology would participate in any identified local government efforts to adopt local sediment protection ordinances similar to the SMS.

**WAC 173-204-110**

Comment by Daniel Syrdal

**C-2.** "This section on applicability should clarify the relationship between the sediment standards and the Department's intent for the application of such standards to other programs...it does not indicate that the standards are specifically not intended to constitute ARARs pursuant to CERCLA or the MTCA. Such a statement is extremely important to avoid improper application of the sediment quality standards... In addition, the section should state that the sediment quality standards set forth in sections 320 through 340 were not developed as a measure of natural resource damage for purposes of natural resource damage assessment under CERCLA, and that the Department, by adopting these standards, is stating no opinion regarding the appropriateness of their use for such purposes."

### Response

For a response on the use of the SMS as "applicable, or relevant and appropriate, requirements" (ARAR's) for CERCLA or MTCA cleanup actions, see response to comment B-66. Regarding the use of the SMS rule in natural resource damage assessments, see response to comment B-16.

### Comment by Thomas Aldrich

**C-3.** "This section should be rewritten to clarify the applicability of the various sections listed. For example, in the second sentence of WAC 173-204-110(1), the word "defined" should be replaced by "specifically designated." The third sentence should be completely revised to clarify whether the referenced WAC sections apply only when a person removes or disturbs surface sediments, or whether they also apply to a person's actions which would "cause or potentially cause... sediments to exceed" applicable standards. This particular sentence is very hard to understand."

### Response

**The second sentence of section 110 (1) has been revised to clarify the applicability of sections 320, 330 and 340 to marine, low-salinity and freshwater surface sediments, respectively. The phrase recommended by the commenter ("specifically designated") was not used in order to avoid confusion with the "designation" process contained in section 310. The third sentence of section 110 (1) has also been revised to clarify the applicability of rule sections.**

### **WAC 173-204-120**

### Comment by Robert Burd

**C-4.** "We suggest adding the term "beneficial uses" to the Part II-Definitions section. This term is used differently in water quality standards programs and sediment programs. Clarification can include a reference to WAC 173-201-045."

### Response

**The phrase "beneficial uses" has been added to the definitions section of the rule. The definition provided is derived from three existing state rules; Chapter 173-201 WAC, Water Quality**

Standards, Chapter 173-500 WAC, Water Resources Management Program, and Chapter 173-200 WAC, Water Quality Standards for Ground Waters. Ecology believes that the definition for beneficial uses in both water quality and sediment programs must be consistent with each other and the federal Clean Water Act, although the focus on specific beneficial uses may be different for each program.

Comment by Daniel Syrdal

**C-5.** "This section should either be revised or deleted. It goes far beyond Department statutory authority... Of particular concern is provision (3) (a), requiring that any reduction of existing sediment quality meet a test of "overriding considerations of the public interest"... Such a stringent standard would seem to be clearly inappropriate...."

Response

Ecology's statutory authority to apply the antidegradation policy to sediments and to require overriding considerations of public interest before authorizing any further degradation of sediment quality derives from the Clean Water Act via RCW 90.48 and RCW 90.54. This authority is based on the need for sediment quality standards to protect the designated beneficial uses of the aquatic environment. As such, the sediment quality standards are functionally equivalent to, and are a key feature of, the federally-approved state water quality standards. This approach is consistent with guidance from the Environmental Protection Agency and the Attorney General's office.

Comment by Thomas Aldrich

**C-6.** "This section should either be revised or deleted, as it goes far beyond statutory authority set forth in either Chapter 90.48 or 90.54 RCW. Although those chapters do set forth general statements on the part of the legislature regarding anti-degradation of the state's waters, it does not specifically relate to sediment and clearly does not grant Ecology the authority to set forth an anti-degradation policy for surface sediments as stated in WAC 173-204-120(3).... We recommend that WAC 173-204-120 be revised to leave subsection (1) and (2) in place and delete subsections (3) and (4) as not reflecting statutory authority granted to the Department of Ecology."

Response

Please see Ecology's response to Mr. Syrdal's comment above.

Comment by Eric Johnson

C-7. "...There should be a policy statement that in all sediment cleanups, the Department of Ecology shall make cleanup decisions in an expeditious manner, and shall proceed with cleanup decisions as soon as adequate information has been gathered to make a decision. This policy might avoid lengthy delays in cleanup actions."

Response

The suggested policy has been included in Part V -- Sediment Cleanup Standards, Section 500 of the rule. The rule revision establishes Ecology policy to make sediment cleanup decisions in an expeditious manner as soon as all necessary information is available, whenever possible given available agency resources and cleanup site priority.

Comment by Eric Johnson

C-8. "It is also appropriate to include the modifying cleanup criteria of Section 570(4) in an administrative policy. These criteria are very important to the success of the sediment cleanup program, but they seem "buried" in the current rule. They should be put in a more "up front" place in addition to Section 570(4)."

Response

The administrative policies of section 130 only include those policies that are broadly applicable to the entire SMS rule. The rule contains more specific policies in other appropriate sections of the rule. Since the modifying criteria addressed in section 570 (4) apply only to sediment cleanup actions, they do not belong in section 130. **However, Part V -- Sediment Cleanup Standards has been revised to include a policy section that better consolidates key sediment cleanup policies.**

**Subsection (1)**

Comment by Daniel Syrdal

C-9. "Subsection 1 of this section should be modified to eliminate the word "fully..."

Response

**The rule has been revised to delete the term "fully" from the referenced subsection. The term is not necessary to the meaning**

of the subsection. "Full protection" of the aquatic environment is already embodied and specifically defined in Part III of the rule.

## **Subsection (2)**

### Comment by Daniel Syrdal

**C-10.** "Subsection (2) of this section is confusing and should be deleted... Certainly, the Department is able to distinguish between these three media."

### Response

**The referenced subsection has been retained, though revised to clarify the applicability of groundwater, surface water and sediment standards at the interfaces between those media.**

### Comment by Thomas Aldrich

**C-11.** "Subsection (2) should be deleted, as it is unintelligible...."

### Response

Please see Ecology's response to comment C-10.

## **Subsection (3)**

### Comment by Daniel Syrdal

**C-12.** "A new provision should be added to this section to reflect the concern included in the general comments about the complexity of this regulation and its need for refinement as experience is gained with application of these regulations. While subsection (3) is intended to somewhat reflect this concern, we believe that the administrative section should clearly set forth the administrative policy that the Department decisions regarding sediment issues shall be made by the central sediment management unit as opposed to being made by permit writers or other regional officials...."

### Response



Please see Ecology's response to comment B-33.

#### **Subsection (4)**

##### Comment by Dr. David Jamison

**C-13.** "You are allowing the application of "alternate technical methods" without outside review and approval. This is an area of major concern. Permit writers would appear to have free hand in subverting the years spent in developing the concepts and tools defined in the Standards by allowing BPJ to be the Standard. Any change in the Standards, unless trivial, should be placed before the implementation committee for review and approval. In addition the landowner should have the approval authority over any changes."

##### Response

Outside review of case-specific changes to the rule requirements will occur as a routine part of public notice requirements for the appropriate regulatory action. Also, DNR, and likely other landowners, are expected to have early involvement in most regulatory and management actions.

Clearly, it is neither Ecology's intent nor historic practice to "subvert" state of the art technical methods via application of Best Professional Judgment (BPJ) authorized under the state Water Pollution Control Act, Chapter 90.48 RCW and the federal Clean Water Act. Rather, Ecology's intent will be to use the latest scientific knowledge as appropriate to meet the environmental and human health protection goals of the SMS. The SMS include specific administrative policy language that states: "Application and use of alternate technical methods shall be allowed when the department determines that the technical merit of the resulting decisions will improve the department's ability to implement and meet the intent of this chapter (Section 130(4))."

Ecology's formation of the implementation committee will, like the SMS rule development workgroups, be for discussion and advisory purposes. Any changes to the rule for technical and policy reasons, will necessitate public review and adoption procedures mandated under the state Administrative Procedure Act, Chapter 34.05 RCW. However, Ecology does not want to eliminate use of "better" technical tools just because they are not codified. Ecology expects implementation procedures e.g., monitoring requirements, use of the sediment impact zone model, to require multiple BPJ decisions during development and implementation. Ecology believes it would be incredibly burdensome and relatively impossible to involve the implementation committee in the frequent BPJ decision-making process to implement the SMS. However,

Ecology is committed to seeking the recommendations of the implementation committee on broad based implementation issues concerning both technical and policy matters including the use of alternate technical methods.

#### **Subsection (7)**

##### Comment by Dr. David Jamison

**C-14.** "Insert here that the review will be done in concert with an implementation committee."

##### Response

Ecology has previously agreed with the recommendations of the SMS Workgroup that "...an ongoing advisory group for the sediment management standards is appropriate, but that the establishment of such a group should not be included in the rule." Further, Ecology believes the activities of the implementation group should be limited to periodic reviews primarily focusing on Ecology's development of implementation documents and the initial list of contaminated sediment cleanup sites. When Ecology recommends changes to the SMS that affect implementation, Ecology will seek the recommendations of the implementation committee.

##### Comment by Richard Ford

**C-15.** "Therefore, we recommend that Ecology add the following sentences to WAC 173-204-130(7): 'In its annual and triennial review, the department shall seek the advice of the Washington Scientific Advisory Board with respect to the methods required under this chapter. The Washington Scientific Advisory Board shall review the scientific basis for such methods and make its recommendations to the department regarding the same'."

##### Response

Please see Ecology's response to comment B-107.

#### **WAC 173-204-200**

#### **Subsection (1)**

##### Comment by Daniel Syrdal

**C-16.** "Subsection (1) indicates that the term "acute" relates to a

relatively short period and then gives the example of ten days. Acute bioassays generally constitute tests measuring effects occurring over far less than 10 days... We would recommend eliminating the ten day reference and clarifying the definition. The Department should consider coordinating the concepts of acute with other biomonitoring programs it is developing."

#### Response

The definition of "acute" has been changed to indicate that it pertains to bioassays conducted for a period of exposure that is relatively short in comparison to the life cycle of the test organism. Reference to 10 days was removed from the definition, although in the case of the amphipod bioassay, the test duration is 10 days and the bioassay is considered to be a measure of acute effects. Ten days is a relatively small fraction of the amphipod's life cycle, and the bioassay endpoint (i.e., mortality) is typically evaluated as an acute response.

#### Comment by Parametrix

C-17. "(1) 'Acute'. Eliminate the phrase 'e.g. ten days'. In the bioassay literature the term acute commonly refers to tests of 96 hours and less when reference is made to the length of the test. Acute rarely refers to ten day tests. The term chronic does apply to many tests of ten days or less usually referring to long term mortality tests or tests that measure sublethal effects."

#### Response

Please see Ecology's response to comment C-16 above.

#### **Subsection (3)**

#### Comment by Parametrix

C-18. "(3)(c, d and e) Eliminate these sections. The effects of this subsection is to artificially raise the area weighted average by only including those stations that exceed criteria. This creates an artificial worst case situation that would appear much worse than the real situation any time many of the stations meet criteria."

#### Response

After consideration of comments received on the proposed SMS, Ecology will eliminate the concept of area-weighted averaging. The final rule will be modified to simply require averaging of the three highest contaminated stations (for chemical contaminants) and comparison to the appropriate screening levels.

## Subsections (9), (10) and (11)

Comment by Dr. Philip Dorn / Dr. Charles Meyer

**C-19.** "Definitions of freshwater and low salinity sediment should be changed. The definition of freshwater and low salinity sediment in section WAC 173-204-200 (9) (10) should use 5 parts per thousand (5 o/oo) salinity as the breakpoint criteria, rather than 0.5 o/oo as stated. EPA has typically used this criteria for testing effluents, although there are inherent problems...."

### Response

The breakpoint between marine and low salinity sediments was retained at 25 parts per thousand, because this is the salinity below which the amphipod Rhepoxynius abronius is affected by the salinity of the test water, as documented in the "Contaminated Sediments Criteria report".<sup>8</sup> The breakpoint between low salinity and freshwater sediments was retained at .5 parts per thousand because the U.S. Environmental Protection Agency commonly applies this value as the definition of freshwater sediments. When Ecology modifies the SMS to adopt freshwater and/or low salinity sediment criteria, the definitions may be changed as appropriate.

Comment by Parametrix

**C-20.** "'Low Salinity Sediment' and (11) 'Marine Sediment'. Eliminate both sections and replace with a 'Saline Sediment' section that includes all sediments with pore water having a salinity of 0.5 parts per thousand or greater. The proposed 25 parts per thousand criteria differentiating Low Salinity and Marine Sediments is arbitrary without any relevance to biological, chemical or physical conditions."

### Response

The suggested abandonment of a low salinity sediment designation is not considered appropriate because the bioassays used for testing of the sediments are not applicable over the entire range of salinities above 0.5 parts per thousand. Please see Ecology's response to comment C-19 above.

Comment by Dr. David Jamison

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<sup>8</sup> Contaminated Sediments Criteria Report" by D. Scott Becker et. al., published by the Washington Department of Ecology in April 1989.

**C-21.** "You should document the basis for the salinity numbers. They seem high to me for an estuarine area such as portions of Puget Sound."

Response

See response to previous two comments above. When Ecology modifies the SMS to adopt freshwater and/or low salinity sediment criteria, the definitions may be further changed as appropriate.

**Subsection (13)**

Comment by Parametrix

**C-22.** "'No adverse effects'". Revise to indicate that no adverse effects may occur under conditions other than those specified by WAC 173-204-320 through 173-204-340."

Response

The definition of "no adverse effects" was not revised. Since the phrase is subject to broad and varying interpretation, the purpose of defining "no adverse effects" was to specifically limit the interpretation of this phrase within the context of the rule.

**Subsection (15)**

Comment by Eric Johnson

**C-23.** "...the references to port 'authorities' should be amended to read port 'districts'. Technically, this state does not have port authorities."

Response

The definition has been revised to read "port district."

**Subsection (16)**

Comment by Daniel Syrdal

**C-24.** "Subsection (16) suggests that Puget Sound includes the land draining into Puget Sound. Puget Sound cannot include the land."

Response

The rule has been revised to modify the term to be called "Puget Sound basin" consistent with the term and definition used in the

draft stormwater management rule, Chapter 173-275 WAC. However, the SMS are only applicable to "surface sediment" within the Puget Sound basin, not land.

Comment by Thomas Aldrich

**C-25.** "Subsection (16), the definition of "Puget Sound" should be revised to reflect the definition as set forth by the legislature in RCW 90.70.005."

Response

Please see Ecology's response to comment C-24.

The rule does not define "Puget Sound" using the definition contained in Chapter 90.70 RCW because the marine sediment criteria are applicable to marine sediments west of the longitude mentioned in the RCW.

**Subsection (18)**

Comment by Eric Johnson

**C-26.** "...the definition of reference area sample may be too restrictive in its requirement that all reference areas meet the standards of Sections 320 through 340. Again, several areas of Puget Sound naturally exceed the standards for metals, and this should not prohibit them from becoming reference areas."

Response

It is not considered appropriate to allow the use of reference sediments with chemical concentrations in excess of the Sediment Quality Standards (SQS), because, by definition, such sediments would be expected to result in some adverse biological effects, including potential toxic effects in laboratory bioassays. Extensive evaluations of potential reference areas in Puget Sound have been conducted as documented in "Interim Performance Standards for Puget Sound Reference Areas"<sup>9</sup> and it has been shown that it is possible to select appropriate reference areas with chemical concentrations below the SQS. It is recognized that some areas of Puget Sound may have naturally occurring concentrations

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<sup>9</sup> "Interim Performance Standards For Puget Sound Reference Areas" by Robert A. Pastorok, et. al., published by the Washington Department of Ecology, June 1989.

of some chemicals, especially metals, higher than the SQS. In a few cases, the maximum concentrations of certain metals (notably cadmium, chromium, and mercury) in potential reference areas of Puget Sound equalled or exceeded the corresponding SQS. However, the SQS allow for cases where the nonanthropogenically-affected background sediment quality establishes the standard. The interim performance standards for Puget Sound reference areas, which were established on the basis of the 90th percentile values for the observed frequency distribution of chemical concentrations in potential reference areas, are in all cases well below the corresponding SQS.

Comment by Daniel Syrdal

**C-27.** "The definition of "reference sediment sample" contained in subsection (18) should specifically include comparable pore water salinities... In addition the limitation preventing reference sediment samples from exceeding applicable sediment quality standards should be deleted. There are conditions in which natural concentrations of certain heavy metals, for example, may exceed the sediment quality standards."

Response

The definition of "reference sediment sample" as proposed indicates that the reference sediment sample represents "the nonanthropogenically affected background surface sediment quality of the sediment sample". This terminology is inclusive of the need for similar salinities between the reference sediment and the sediment sample, as well as other chemical and physical properties. Therefore, the definition has been retained as proposed.

Similarity of the pore water salinities for the reference sediment sample and sediment sample is perhaps most important for the assessment of benthic infaunal abundances, and less important for the bioassays. For the amphipod bioassay, as long as the interstitial salinity is greater than 25 parts per thousand, this variable should not influence the results of the test, even if the interstitial waters in the reference and test sediments are not of exactly the same salinity. In addition, interstitial salinities are generally not an issue for the larval bioassays (because of the small amounts of sediments tested relative to the amount of clean seawater in each test chamber) and the Microtox test (because interstitial water is substantially diluted by the Microtox diluent during initial extraction and subsequent conduct of the test).

On the issue of accepting the use of reference sediments with chemical concentrations above the sediment quality standards, please see Ecology's response to comment C-26 above.

Comment by Thomas Aldrich

**C-28.** "... The physical and chemical characteristics of the reference sediment sample should also include comparable pore water salinity...."

Response

Please see Ecology's response to comment C-27 above.

**Subsection (22)**

Comment by Parametrix

**C-29.** "'Surface Sediments'. Revise the definition. This definition is so vague that it is of little value."

Response

**The rule has been revised to clarify the definition of "surface sediments."** However, Ecology has not included a specified depth within the definition of surface sediments because of the known wide variability of biologic activity at different sediment depths, and the impacts of human activities, (e.g., dredging) which expose "new" surface sediments at depths which previously may not have supported biological activity. Ecology believes the determination of what is "surface sediments" should be made on a case-by-case basis during implementation of the rule.

**WAC 173-204-310**

Comment by Thomas Aldrich

**C-30.** "The introductory portion of this section should specify that all sampling referenced in the section must be in accordance with WAC 173-204-600 and 610...."

Response

**Section 310 of the rule has been revised to include a reference to the pertinent requirements of sections 600 and 610. This includes a policy statement on the importance of using data that meets applicable quality assurance and quality control standards and a direct mention of the Puget Sound Protocols.**



## Subsection (2)

### Comment by Daniel Syrdal

**C-31.** "Subsection (2) of this section relating to confirmatory designation, should be changed in two ways. First, confirmatory designation through biological testing should be limited to those cases where the surface sediment has exceeded an applicable chemical concentration criteria or human health criteria... To allow or require biological tests when all such concentration standards are met is contrary to the intent of the methodology. In addition, the later subsections of this section seemingly recognize this by only providing for confirmatory tests of surface sediments which exceed criterion... The second major problem with the confirmatory designation provision is its failure to recognize unusual circumstances where thriving biological communities may exist despite the fact that the sediment involved may fail one of the confirmatory tests. This regulation should be modified to allow for a further demonstration of sediment quality on a case-by-case if one of the confirmatory biological tests is failed... We would suggest that the Department include a provision for allowing a demonstrated showing of high levels of benthic infauna abundance and diversity as a third confirmatory test."

### Response

It is not considered appropriate to limit confirmatory testing to situations in which there are chemicals in exceedance of the Table 1 criteria. There may be situations in which all of the chemicals for which there are presently Table 1 criteria are only present in low concentrations, but there is still a reason to believe there may be toxic effects associated with other chemicals for which there presently are no criteria. Two examples could be used to illustrate this point. Marinas may have sediment concentrations of tributyl tin (TBT), formerly used as a biocide in antifouling paint, sufficiently high to have toxic effects. Sediments in the vicinity of pulp mills may have concentrations of certain chemicals (e.g., guaiacols, dioxins) with potential toxic effects.

There are presently insufficient data available to establish sediment quality standards for these chemicals, and the only way to evaluate the potential toxicity of those sediments would be to conduct confirmatory biological testing.

It is also not considered appropriate for a demonstration that a resident biological community has high abundance and diversity to "override" a determination of adverse effects resulting from an acute or chronic bioassay. The justification for having a suite of confirmatory tests is that they may be protective of a variety of ecosystem components that would not be equally protected by

relying on the results of a single test, including the benthic infaunal abundance test. An adverse effect demonstrated in a laboratory bioassay is considered to be indicative of an effect that should be protected against in nature, whether or not we were able to demonstrate that an indigenous community as a whole provides evidence of such a toxic effect.

Comment by Daniel Syrdal

**C-32.** "Subsection (2)(b) should be reserved until the Department obtains enough information to implement such sections by rule... It provides no intelligible guidance, however, for a regulated party that must determine how to comply with these new sediment rules and regulations. It should therefore be deleted until rules are developed."

Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

Comment by Thomas Aldrich

**C-33.** "WAC 173-204-310(2) should be revised to add an additional step in the "confirmatory designation" process....the Department should be willing to consider a final third step in which the benthic abundance and diversity would be checked to determine whether the population is so health that the benthic infauna abundance should overrule the fact that one of the acute effects biological tests was failed. In such a case, for example, the Department could require a greater showing of benthic abundance pursuant to WAC 173-204-315 (2)(c) than might otherwise be required if both acute effects biological tests were passed."

Response

Please see Ecology's response to comment C-31 above.

Comment by Thomas Aldrich

**C-34.** "WAC 173-204-310 (2)(b). In conducting rule-making under the Washington Administrative Procedure Act, the Department of Ecology cannot by rule reserve the power to decide on a case-by-case basis criteria, methods, and procedures not specified in the rule...."

### Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

### Comment by Richard Ford

**C-35.** "...We believe, however, that only the permittee/proponent should have the authority to either accept the chemical designation or opt to confirm the level of adverse effects with direct biological testing.... Therefore, we suggest that the language of WAC 173-204-310(2) be changed accordingly."

### Response

It is not appropriate for the rule to condition the application of biological testing to measure sediment quality and compliance with rule standards. The primary reason for this is the inherent value of biological testing in resolving the uncertainty associated with predicting the presence or absence of biological effects by the use of chemical testing alone. While this uncertainty is relatively minor and acceptable in many of the cases found in Puget Sound, it does not accommodate all possible conditions. For example, biological testing is certainly appropriate when evaluating the effects of a chemical that is not on Table I in the rule. It may also be appropriate when evaluating sediment quality in areas of the Sound with very different sediment characteristics that has not been previously sampled. And the use of biological testing may depend on the burden of proof deemed necessary with any particular regulatory or management decision, thus requiring rule flexibility for different program applications. Ultimately, the chemical testing is a less expensive way of predicting the biological effects of sediment contamination and must remain subject to biological testing information as it becomes available.

Given the value of direct biological testing information, Ecology does not want to limit the independent application of biological testing by others outside the agency. The cost of sampling and biological analysis of sediments is likely to minimize any independent evaluation. However, if made available, the use of these data in decisionmaking will depend on their quality and will be considered in a cooperative and coordinated manner with permittees and other parties vested in the regulatory action.

Please see Ecology's response to comment B-18 above.

For these reasons, the rule does not constrain the broad use of biological testing by any and all parties.

Comment by Richard Ford

**C-36.** "The language regarding biological testing, found in WAC 173-204-310(2)(a) (proposed), also does not indicate who may decide what specific acute and chronic biological tests to use. The final rule should give the permittee/proponent the ability to choose the specific biological tests. Otherwise, third parties could require or use the most sensitive test methods to increase the possibility of "flunking" sediments."

Response

The rule purposefully avoids restricting who may decide which of the biological tests are appropriate for any given case. This provides the necessary flexibility for rule implementation, where the implementing programs may establish a routine approach to evaluating sediment quality for their cases. In some cases, the availability of the biological testing organisms will dictate the appropriate test. In other cases, prior experience with a particular sediment may suggest the use of a certain biological test organism. While the rule provides the flexibility to address the situations mentioned above, Ecology intends that the selection of the biological testing organism be done by the permittee/proponent in the majority of cases.

Given the number of factors that affect biological response to sediments, it is unlikely that someone could target the "most sensitive" animal in advance. If a third party develops biological response data that conflicts with the information developed by Ecology, the review and evaluation of these data would be conducted in a coordinated and cooperative manner with all parties. See response to previous comment above.

Comment by Parametrix

**C-37.** "(2) Confirmatory designation.... "The most important point of this section is that if the biological tests of sediment samples do not exceed any of the criteria defined in section 320-340, those sediments are deemed to have met all sediment quality criteria, without further testing.... The concept of using biological testing in lieu of chemical testing is valid and pragmatic. However, the excessively stringent criteria proposed for the biological tests will cause many sediments, supporting very healthy benthic communities, to be classified as not meeting

the quality criteria.... The interpretation would be correctly made that some of those stations are clean under these criteria. However, some would fail because of the excessively stringent criteria for pass-fail in the bioassay tests for these standards."

Response

Please see Ecology's response to comments B-91 and C-31 above.

**Subsection (3)**

Comment by Dan Syrdal

**C-38.** "Subsection (3) should be reserved until the Department obtains enough information to implement such section(s) by rule ... It provides no intelligible guidance, however, for a regulated party that must determine how to comply with these new sediment rules and regulations. It should therefore be deleted until rules are developed."

Response

This section of the rule makes it clear that Ecology will address "other deleterious substances" (as defined in Part II of the rule) in a manner appropriate to the circumstances and the materials being evaluated in any given case. It provides an important component to the flexibility of rule implementation and serves as a clear expression of Ecology's approach to other adverse sediment effects.

Comment by Thomas Aldrich

**C-39.** "Likewise, WAC 173-204-310(3) is unreasonably vague in that it does not set standards, but rather merely identifies a vague procedure for identifying and setting standards for substances not otherwise listed in Tables I, II, and III. This section should be deleted."

Response

Please see Ecology's response to comment C-38 above.

Comment by Dr. Philip Dorn / Dr. Charles Meyer

**C-40.** "Section 173-204-310 (3)(a-d) amplifies this issue in providing the department the right to designate individual contaminants of concern not covered in the standards, identifying test methods and sampling procedures, identify acceptable levels of contamination which contain other toxic, radioactive, biological or deleterious substances. There is too much

flexibility and opportunity to over-regulate without specific procedures for evaluation."

Response

Please see Ecology's response to comment C-38 above.

**WAC 173-204-315**

Comment by Parametrix

**C-41.** "(1) Five acute and chronic effects biological tests. All scientific names included in this and later sections should be printed either in italics or underlined."

Response

The use of print styles is generally governed by the Office of the Code Reviser. Underlining and bold print styles are not allowed. Italics may be used by specific request. Ecology will request that scientific names be italicized in the final rule.

Comment by Thomas Aldrich

**C-42.** "This section applies only to Puget Sound marine surface sediments. Thus, it is subject to RCW 90.70.080(2) which requires an agency to take a number of factors into consideration in determining whether to adopt rules on less than a statewide basis. There is nothing in this rule-making which would evidence that these factors have been considered."

Response

Most of the factors to be considered pursuant to RCW 90.70.080(2) were evaluated during rule development and documented in the draft economic impact statement. As planned, the analysis will be completed after public review of the rule and related documents, and completion of the final economic impact statement. The analysis will be completed prior to adoption of the SMS, pursuant to the requirement of the RCW.

Comment by Daniel Syrdal

**C-43.** "...The regulations should take into account the need to modify or use alternative tests in certain situations...."

Response

Section 130 of the rule contains a policy allowing the use of "alternate technical methods" and describes Ecology's commitment to using the latest scientific knowledge in modifying technical methods contained in the rule. Also, Section 315 contains a reference to section 130.

Comment by Daniel Syrdal

**C-44.** "Where the protocols for various bioassays provide for static bioassays, we would suggest the option be provided to use flow-through bioassay techniques as being more representative of the real world."

Response

Considerable effort has gone into the development of appropriate bioassays for assessing Puget Sound sediments. The bioassays described in this subsection have been developed and tested using static conditions and should only be conducted under such conditions. The use of flow-through conditions would add an additional variable to the test that could influence test results.

Flow-through conditions could remove contaminants diffusing out of the sediment and thereby reduce the apparent toxicity of those sediments. Because there are a multitude of flow regimes in the environment, it would be difficult to identify any single regime as being representative of the "real world." Instead, it is more environmentally protective to use static conditions to represent an exposure regime that may be approached in sheltered depositional areas in the environment. In addition, because flow-through testing can only be conducted by laboratories located near a seawater source, the specification of such testing would substantially reduce the number of bioassay laboratories capable of conducting these tests.

It should be noted, however, that the potential use of flow-through bioassays is not categorically precluded. Both WAC 173-204-315(1) and WAC 173-204-130(4) provide for the use of alternative bioassay procedures, subject to Ecology's advance review and approval.

Comment by Daniel Syrdal

**C-45.** "Any of the tests which require comparison with reference areas present significant problems which should be recognized in the proposed regulations with a mechanism to deal with situations in which good representative reference areas are not available...."

Response

The potential difficulties associated with identification of an appropriate reference area are acknowledged by Ecology. It should be noted, however, that considerable effort has gone into the identification and evaluation of potential reference areas as defined in "Interim Performance Standards for Puget Sound Reference Areas".<sup>10</sup> The department plans to identify suitable reference area locations and reference sediment performance standards for incorporation into the SMS. The confirmatory tests that are most likely to be affected by a "poor" match with reference area conditions are the amphipod bioassay and the assessment of benthic infaunal abundance.

In the rare event that a test sediment is so unique that a reference sediment cannot be found that provides an appropriate match, section 130 of the rule allows the use of alternative tests.

Comment by Daniel Syrdal

**C-46.** "Similar problems relate to benthic infaunal abundance... With respect to abundance, biomass should also be considered as well as numerical abundance data."

Response

Assessment of benthic biomass is not considered appropriate for the characterization of benthic communities in comparisons of reference and potentially impacted areas. There are two primary reasons for this conclusion. First, measurements of benthic biomass can be complicated by several factors. Some taxa lose weight when immersed in preservative fluids, while others gain weight. While more accurate biomass estimates could be made by analyzing live specimens, this is rarely practical. Evaporation of the 70 percent alcohol in which the specimens are usually stored, in conjunction with small variations in specimen drying time, will introduce errors in biomass measurements. In addition, parts of organisms are frequently lost or damaged during field collection and sieving, which reduces the biomass estimates for those taxa. Shelled organisms present further problems because either the soft tissues must be removed from the shells (a process which is time consuming and not 100 percent efficient), or conversion factors must be used (which require development and introduce additional error components). Second, biomass data are susceptible to considerable bias associated with the chance occurrence of one or a few large, rare organisms (e.g., large

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<sup>10</sup> "Interim Performance Standards For Puget Sound Reference Areas" by Robert A. Pastorok, et. al., published by the Washington Department of Ecology, June 1989.



bivalve molluscs) in a given sample, that may far outweigh the biomass of all other macroinvertebrates in that sample.

#### **Subsection (1)**

##### Comment by Robert Burd

**C-47.** "The larval test is referred to as the **"forty eight to seventy two hour** mortality/abnormality sediment bioassay". We suggest dropping the timing descriptor when referring to the larval test. At times during the past year this test required more than seventy two hours to complete...."

##### Response

**Reference to the duration of these bioassays was removed from this subsection. The chapter of the Puget Sound Protocols dealing with bioassays describes the durations of these bioassays.**

##### Comment by Robert Burd

**C-48.** "Crassotrea giga should be spelled Crassostrea gigas."

##### Response

**The rule has been corrected to read "Crassostrea gigas."**

##### Comment by Robert Burd

**C-49.** "The microtox saline extract test is listed as a chronic effects test, however, the definitions section lists the microtox response as an acute effect. The definitions for acute and chronic effects tests need to be consistent with the list of bioassays on p. 19 [section 315]. In addition, the reserved microtox section at the bottom of page 20 [section 315] should include the rationale for interpretation of the microtox bioassay as a chronic effects test."

##### Response

The Microtox test is considered a surrogate for a chronic test based on the results obtained during the Commencement Bay RI/FS. Those results indicated that the test was much more sensitive to sediment contamination than were either of the acute tests evaluated (i.e., the amphipod and bivalve larvae tests) or alterations of benthic macroinvertebrate assemblages. This higher degree of sensitivity was considered to be representative of the sensitivity one might expect from a chronic bioassay. To avoid confusion, **the rule has been revised to delete reference to the Microtox endpoint in the definition section.**

Comment by Robert Burd

**C-50.** "Technical terms used throughout the Standards require reference to the Puget Sound Protocols, e.g., working definitions of "abnormality" and "mortality". However, the Protocols are not referenced until p. 104, line 19 [section 600]. It should be made clear that the Puget Sound Protocols are to be used unless specifically stated otherwise. In addition, divergence from the Puget Sound Protocols should be specifically noted somewhere to prevent confusion...it is unclear in a number of places whether Puget Sound Protocols are being entirely superseded by this document....?"

Response

**The rule has been revised in section 310 to include a direct reference to the Puget Sound protocols and to related section 600.** While the rule does provide additional guidance on test interpretation and on the use of reference and control sediments, it does not intend to supersede any of the essential analytical or quality assurance requirements of the Puget Sound protocols. Section 600 specifically addresses the use of alternate methods by Ecology approval and by exceptional case.

Comment by Robert Burd

**C-51.** "Have reference areas been designated and what are the criteria for selection?"

Response

While the rule provides performance standards for reference area sediments, it does not identify specific reference areas within Puget Sound or elsewhere in the state. This approach allows the appropriate reference area to be selected on a site-specific basis. Though guidance for selection of reference areas has been developed by federal and state programs, and several lists of reference areas are currently available (including one in Ecology's Interim Sediment Evaluation Process <sup>11</sup>), no specific or formal criteria have been agreed to by all agencies. To better address this issue, Ecology is participating with EPA in ongoing studies to improve reference area performance standards and to list specific areas as suitable for reference area sediments.

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<sup>11</sup> "Interim Sediment Quality Evaluation Process" by the Washington Department of Ecology, December 1989.

Comment by Robert Burd

**C-52.** "'Worm' test should be changed to juvenile polychaete ('worm') tests throughout the document. Because this is the formal documentation of the Sediment Management Standards, we feel juvenile polychaete is the more appropriate reference."

Response

**The rule has been revised to replace the phrase "juvenile worm" with the phrase "juvenile polychaete."**

Comment by Parametrix

**C-53.** "(1)(a)(i) Amphipod. ...The acknowledged problem with using this organism is that it is sensitive to very fine-grained sediments that are common in central and south Puget Sound. ...language should be included in this section to make provisions to deal with fine-grained sediments. We recommend that the language be altered to allow for substitution of Rhepoxynius with another amphipod either Ampelisca abdita, or the 10-day Neanthes acute test, when fine-grained sediments are a problem..."

Response

At present, there is no other 10-day mortality test that has been used enough in Puget Sound to determine whether it is an adequate substitute for the test using Rhepoxynius abronius. In rare cases where a matched reference sediment cannot acceptably block the grain size effect, the rule allows the use of alternate test methods.

Comment by Parametrix

**C-54.** "(1)(a)(ii)(A) The scientific name of the Pacific oyster is Crassostrea gigas not 'Crassostrea giga'. "Although in common use, the oyster test has documented deficiencies.... Oyster larvae, in nature, are never confined in a near sediment condition. Confinement with sediments results in fouling of the larvae, or their entrapment in sediment resulting in physiological stress or death, regardless of the degree of sediment contamination. Although they can be reared easily in containers without sediments, these larvae are unsuitable for analyses containing test sediment (Strathmann, 1987)."

Response

The commenter's point about oyster larvae never being confined in a near-sediment condition in nature is only partially correct. While it is agreed that confinement in such an environment is

indeed unlikely in nature, it is entirely possible that the larvae may be exposed temporarily to sediments on the bottom, and that abnormalities or mortality resulting from such exposures must be considered as adverse effects. The oyster larvae bioassay is therefore considered to be an ecologically relevant acute test. Further, the oyster larvae has shown a high concordance to benthic community response. The bioassay protocols chapter of the Puget Sound Protocols is currently being revised; one notable change will be the requirement for a 4-hour settling time in the experimental chambers prior to introduction of the oyster larvae, which should alleviate some of the problems with oyster larvae mortality that may be associated with suspended particulates.

Comment by Parametrix

**C-55.** "(1)(b) Chronic Effects Tests. This section gives equal interpretive weight to the three types of chronic tests. Of those, the Microtox test is the least expensive at about \$150/station, as compared to \$900/station for Neanthes, and \$5000 - \$8000/station for benthos analysis. Operating under the rule established in 310(2), it will make sense to recommend that clients use Microtox testing over the other options. "Microtox is relatively insensitive to non-water soluble contaminants.... Using Microtox as the only chronic indicator may provide misleading conclusions regarding sediment quality."

Response

Like other bioassays, microtox has shown different sensitivity to different contaminants. This is one of the reasons for requiring that several biological tests be conducted.

Comment by Parametrix

**C-56.** "(1)(b)(i) Benthic infaunal abundance. This requirement needs modification. If only major taxa are assessed Echinoderms should be included as one of the major taxa. The Phylum Echinodermata (sea stars, urchins, sea cucumbers and related animals) is one of the most abundant and ecologically important taxa in the Puget Sound region. In many of the benthic communities of the Puget Sound as defined by the draft sediment management standards, echinoderms are the dominant animals (Birkland 1974; Engstrom 1974; Highsmith 1982; Kozloff 1983, 1987; McEuen 1986; Parametrix 1989). "In addition to abundance, evaluation of the benthos by other factors is necessary. Abundance data, in and of itself, can be misleading. The relative biomass of the taxa should also be addressed.... The biomass must be measured to adequately characterize a benthic community."

Response

The ecological importance of the echinoderms in the Puget Sound region is recognized, but there are several reasons why they are not recommended for evaluation in routine determinations of pollutant impacts. Most adult echinoderms are classified as benthic megainvertebrates, rather than benthic macroinvertebrates, which have historically been the focus of investigations of pollutant impacts. Echinoderms tend to be large, relatively rare numerically (especially in soft-bottom habitats), and motile. They are difficult to sample quantitatively, and are not routinely captured in the benthic grabs used for the collection of sediments. Even if another sampling device (e.g., beam trawl) were to be used, the low abundance and patchy distribution of most echinoderms make it extremely difficult to draw statistical conclusions about observed differences between communities in different areas (e.g., reference and study areas). The extreme example of echinoderm abundance cited by the commenter (i.e., 600-800 sand dollars per square meter in Dyes Inlet) has probably been observed only rarely, if at all, in more typical Puget Sound environments, including both reference areas and urban embayments.

The motility of most echinoderms also renders them less desirable as indicators of pollutant stress associated with sediment contamination within a given area, whereas the relatively stationary benthic macroinvertebrates are much more likely to provide evidence of pollutant stresses because of their constant exposure to sediment contamination within a given area. Due to their relatively large size, echinoderms may make up a significant fraction of the total benthic biomass, but numerically, they are generally far less abundant than the benthic macroinvertebrates. Finally, some echinoderms (e.g., sea urchins) are typically found in hard-bottom environments, and not in the depositional, soft-bottom environments that are usually the focus of benthic pollution studies.

On the issue of including an assessment of benthic biomass, please see Ecology's response to comment C-46 above.

#### Comment by Parametrix

**C-57.** "(1)(b)(ii) Juvenile worm. This is a 20-day growth test conducted with the polychaete worm Neanthes arenaceodentata. As an acute test, it is well characterized and has been part of both U.S. EPA and Corps of Engineers regulatory testing program. However, this is the first time that this organism has been written into a regulatory program as a chronic test. Ecology is applying this test without having conducted sufficient laboratory testing of the organism to document the validity of using weight gains of this worm as a regulatory tool. "Until further evaluations can be conducted and reviewed by the scientific community on the response of Neanthes to a wider range of actual

test sediments, no regulatory interpretations should be made. We argue that inclusion of this organism at this time is inappropriate."

#### Response

While it is true that this is the first time that the 20-day Neanthes sp. bioassay has been applied in a regulatory program, it is not true that insufficient laboratory testing has been conducted to document the validity of using weight gains of this worm as a regulatory tool. Extensive investigations have been conducted of various aspects of the use of Neanthes sp. in the 20-day bioassays. Included have been experiments to define: the effects of sediment grain size on juvenile growth; the effects of worm density, food density, and test duration on bioassay performance; and the salinity tolerance of the species. The results of these experiments have been documented and discussed in detail by Johns and Ginn (1990)<sup>12</sup>. In addition, further studies of the possible effects of sediment grain size on juvenile growth are being conducted for Ecology as part of an investigation of potential reference areas in Puget Sound.

It is also not true that results have only been published for the use of this bioassay on sediments from three areas: Elliott Bay, Commencement Bay, and Eagle Harbor. The study (Johns 1988)<sup>13</sup> which tested sediments from those three contaminated areas also included the use of sediments from the Des Moines/Seahurst area of East Passage as reference sediments, and sediments from West Beach on Whidbey Island as control sediments. More recently, the study by Johns and Ginn (1990)<sup>14</sup> tested sediments from Elliott Bay, West Beach, Carr Inlet, and the mouth of the Duckabush River. The investigation of potential reference areas in Puget Sound presently being conducted for Ecology has also applied the Neanthes sp. 20-day bioassay to sediments from Samish Bay and Useless Bay. The bioassay has also been successfully applied to sediments from areas outside Puget Sound, including Vancouver Harbor and Halifax Harbor in Canada, as well as the North Sea.

In all applications of this bioassay to date, the researchers have

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<sup>12</sup> "Development of a Neanthes Sediment Bioassay for Use in Puget Sound", Prepared for U.S. Environmental Protection Agency, Region 10, Office of Puget Sound, by PTI Environmental Services, 1990.

<sup>13</sup> "PSDDA Sublethal Test Demonstration", Prepared for U.S. Army Corps of Engineers, Seattle District, by PTI Environmental Services, 1988.

<sup>14</sup> Ibid.

not reported any problems conducting the bioassay or interpreting the results. Sediment grain size has been shown to not have an adverse effect on the use of the bioassay, although reference sediments should be similar in both grain size and total organic carbon (TOC) content to the sediment being tested (Johns and Ginn 1990)<sup>15</sup>. Growth of Neanthes sp. is responsive to changes in sediment quality, and interpretive criteria are well established.

It is not possible to comment on the results cited by the commenter, in which Neanthes sp. grew better in contaminated sediments than in control sediments, because the results have not been published or provided for review.

While it is true that the Neanthes sp. 20-day bioassay has not been adopted for use by the Puget Sound Dredged Disposal Analysis (PSDDA) program, this is not because of "incomplete testing and inconclusive results," as inferred by the commenter. As a result of recommendations made at an experts meeting convened to discuss use of the Neanthes sp. 20-day bioassay, further research is currently being conducted to examine the relationship between juvenile growth or biomass (the primary response criterion of the bioassay) and eventual reproductive success of the adults. The results of this long-term experiment appear promising, and it is expected that the bioassay may be adopted for use in dredged material testing following completion of the experiment and review of the data.

For the reasons discussed above, it is considered appropriate to include the Neanthes sp. 20-day bioassay as a valid evaluation procedure in the SMS.

## **Subsection (2)**

### Comment by Parametrix

**C-58.** "(2)(c) Benthic abundance. All subsections should be amended to include biomass as well as numerical abundance data. Benthic analysis should consider all information available rather than take the simplest approach of limiting information to four major taxonomic categories."

### Response

Please see Ecology's response to comment C-46 above.

### Comment by Parametrix

**C-59.** "(i) Taxonomic richness. This a simplistic approach that

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<sup>15</sup> Ibid.

ignores both the complexity for the benthic communities that inhabit the marine environment, and the considerable volume of knowledge that exists.... The proposed approach provides little ability to determine anything more than a difference exists between test and reference areas. Neither the cause nor the effect of this change can be determined from this approach. "(ii) Normally abundant species (iii) Normally rare species and (iv) Abundances of normally rare species. These provisions all rely on the very basic assumptions that an identical reference area can be selected, and that no influence other than sediment contamination will affect the benthic communities. These assumptions have not been met in past benthic studies in Puget Sound. To anticipate that they will suddenly be met in all or even most future studies is not reasonable."

### Response

This comment addresses four performance standards for reference areas considered for use in the benthic infaunal abundance test. Although it is unlikely that a perfect reference area can be found for each test area, it is possible to identify reference areas that are very similar to test areas with respect to most of the major variables known to influence the characteristics of benthic communities (e.g., season, salinity, depth, sediment characteristics). Reference areas therefore provide the best available estimates of natural benthic communities. The reference area approach has a substantial historical precedent for impact assessment and provides clear, objective, testable hypotheses that are easily understood by most interested parties, both technical and nontechnical. In conducting this approach, every effort is made to select a reference area that is as similar to the test area as possible. If such an area cannot be found, the option exists to use bioassays, rather than benthic macroinvertebrate assemblages, as the indicators of toxic effects.

**WAC 173-204-320**

### **Table I**

#### Comment by Daniel Syrdal

**C-60.** "Table I is based on the AET approach, which approach has significant problems as set forth in the general comments. In many cases it establishes levels which are far too conservative, as such levels do not represent significant impacts on aquatic biota."



### Response

Please refer to Ecology's responses to the following similar comments: comments A-10, A-11, A-34, B-13, B-21, B-31, B-53, B-85, B-110, and B-111.

### Comment by Daniel Syrdal

**C-61.** "Footnote I to Table I is inappropriate. The requirement that one assume an undetected chemical or isomer is present at its detection limit is unduly conservative and not reflective of reality... It should be noted that the proposed regulations implementing the cleanup standard provisions of the MTCA provide that nondetectable quantities are to be assumed at one half of the detection limit."

### Response

The values shown in Table I of the proposed rule are intended to be compared with detected values for each chemical. Therefore, analyses should be conducted so that detection limits will be lower than the values shown in the table. However, in some cases, the values represent the summation of concentrations for individual compounds in a related group of chemicals (e.g., LPAH, HPAH). If one or more of these chemicals is not detected, then the detection limit for that chemical would be used in the sum for the entire group of chemicals. Ecology chose to be conservative in adopting this approach because it reflects the level of uncertainty that can actually be documented in the chemical analysis. The approach is not unduly conservative because biological testing is available as an option to confirm the presence of adverse biological effects.

### Comment by Thomas Aldrich

**C-62.** "As with WAC 173-204-315, there is no showing that Ecology has taken into account the factors set forth in RCW 90.70.080(2) in determining to limit the applicability of Table I to Puget Sound sediments. "

### Response

Please see Ecology's response to comment C-42 above.

### Comment by Dr. Philip Dorn / Dr. Charles Meyer

**C-63.** "It appears that some of the criteria were incorrectly copied from the table of AET values. The Table I criteria for indeno (1,2,3, -c,d) pyrene is shown as 34 ppm, although the lowest AET value is 33 ppm using oyster test results.

Dibenzo(a,h) anthracene is shown as 12 ppm (on a carbon normalized basis) in Table I. The lowest AET value is 3 ppm. The data source for total PCB's is not clear, and should be identified."

#### Response

According to the AET database, SEDQUAL (PTI 1990),<sup>16</sup> the lowest AET values listed in Table I are correct. This database is the definitive data source for all AET values, including total PCBs. The AET values listed in Barrick et al. (1988)<sup>17</sup> contain two transcription errors that should be corrected, as follows:

- The oyster AET for indeno(1,2,3-c,d)pyrene should be 34 ppm, not 33 ppm organic carbon
- The oyster AET for dibenzo(a,h)anthracene should be 12 ppm, not 120 ppm organic carbon.

The other AET values for dibenzo(a,h)anthracene are 47 ppm (amphipod AET), 89 ppm (benthic AET), and 33 ppm (Microtox AET). Therefore, 12 ppm is the lowest AET for dibenzo(a,h)anthracene.

#### Comment by Parametrix

**C-64.** "Table I, footnotes 3 and 4. There is a difference between the total LPAHs criteria and the sum of the criteria for the chemicals that are identified as comprising the sum. This is also the case for HPAHs. The relationship is not consistent from Table I to Tables II and III. In Table I, the sum of criteria are greater than the criteria for HPAHs while in Table II and III the sum is less than the criteria. In Table II and III there is a threefold difference between the sum of the criteria for LPAH chemicals and the criterion for LPAHs. These inconsistencies indicate either a mistake or a serious flaw in the methods used to determine the various criteria. "Tables II and III appear to be identical. Why include this redundancy when reference to Table II in place of Table III would suffice?"

#### Response

Sediment quality standards for individual PAH compounds can be greater than the total for a couple of reasons. First, the

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<sup>16</sup> "Retrieval from the SEDQUAL database" by PTI Environmental Services, 1990.

<sup>17</sup> "Sediment Quality Values Refinement: 1988 Update and Evaluation of Puget Sound AETs", by PTI Environmental Services, 1988.

determination of AET for individual PAH compounds and total PAH are conducted independently. Because individual PAH compounds do not perfectly covary in Puget Sound, total PAH do not covary with any individual PAH compound (and thus result in an AET for total PAH that corresponds to the sum of individual PAH compounds). Second, sediment quality values for different chemicals may be associated with different biological indicators, and would not be expected to display any interrelationship.

Tables II and III are included separately so that each section of the rule can stand alone. Table II is in the section of the rule discussing sediment impact zones and Table III is in the section discussing the sediment cleanup decision process. In most situations, only one of these sections will be of interest to a regulated party.

## **Subsection (2)**

### Comment by Parametrix

**C-65.** "(2) Chemical concentration criteria. Designation of sediment quality on the basis of sediment chemical content alone is inappropriate. If those chemicals are not biologically available, then assessing the sediments by their chemical concentrations is not a valid way to determine whether or not those chemicals have an environmental effect. "...Chemical concentration information should be supplemented with appropriate benthic community data to determine sediment toxicity whenever toxicity is indicated."

### Response

The sediment quality standards are based on a level of biological effects corresponding to "no adverse impacts". The numerical criteria have been developed to represent the level at which no adverse impacts are observed in any of the biological tests used to set the standards. However, Ecology recognizes that at the same site, chemical concentrations may not reflect bioavailability; therefore, WAC 173-204-310 (Sediment quality standards designation procedures) contains procedures for designating surface sediments based on confirmatory biological testing (including benthic infaunal abundance). Because biological testing is a more direct method of assessing sediment toxicity, biological testing results outweigh the numerical standards for designating sediments. The biological testing procedures have been incorporated to allow bioavailability to be addressed on a site-by-site basis.

## **Subsection (3)**

Comment by Thomas Aldrich

**C-66.** "WAC 173-204-320(3)(b). The abnormality/mortality numbers utilized in this subsection are unreasonably conservative. A normal survivorship of less than 80% and a mean combined abnormality and mortality greater than 20% relative to time-final in the reference sample should be acceptable. We request that Ecology revise the numbers in this subsection accordingly."

Response

The numbers are based on survivorship in the reference, without consideration of survivorship in the control, and are based on time-final rather than time-initial. Further, the requirement of a statistical difference between test and reference survivorship also exists. For these reasons, the numbers are not considered to be overly conservative.

Comment by Thomas Aldrich

**C-67.** "WAC 173-204-320(3)(c). The performance standard for benthic abundance should be revised for the reasons set forth in the attached comments of Parametrix on this section."

Response

For the reasons discussed in comments C-46, C-56, and C-58 above, it is not considered appropriate to abandon the performance standard for benthic abundance. A change in a benthic community that is both statistically significant from a reference area and that includes a greater than 50 percent reduction in the abundance of one of the three major taxa is a substantial adverse effect that should be protected against. The proposed changes to this measure would considerably complicate the assessment of benthic abundance without improving the chances of detecting adverse effects, should they occur.

Comment by Daniel Syrdal

**C-68.** "Subsection (3)(b) is unduly restrictive. Given the variability normally associated with sediment larval bioassays, a 15% difference can often be within one standard deviation of the reference sediment. The D interpretive guideline of 20% should be utilized."

Response

Please see Ecology's response to comment C-66 above.

Comment by Daniel Syrdal

**C-69.** "The benthic abundance tests set forth in subsection (3) (c) is defective. First, echinoderms should be added to the list of major taxa. Secondly, measuring environmental change by recording only the changes in the major taxa is not appropriate."

Response

The reasons for not altering the performance standard for benthic abundance are discussed above in Ecology's responses to comments C-56 and C-58.

Comment by Robert Burd

**C-70.** " '...test mean mortality' would be less confusing as '...test sample mean mortality'."

Response

**The rule has been revised to replace the phrase "test mean mortality" with the phrase "test sediment mean mortality."**

Comment by Parametrix

**C-71.** "(3)(b) Biological effects criteria. Larval. This section defines interpretive threshold criteria for the larval bioassays as being both statically different from and greater than 15% mortality over the reference sediment (as combined mortality and abnormality). The 15% criteria is too stringent.... We recommend that the commonly accepted D interpretive guideline of 20% mortality be adopted."

Response

Please see Ecology's response to comment C-66 above.

Comment by Parametrix

**C-72.** "(3)(c) Benthic Abundance. A criterion based on abundance differences of 50% or mean numerical abundances of one of the 'major taxa' is not valid. The concept of the importance of 'major taxa' is an artificial construction based on two invalid assumptions. The first is the assumption that all species in the major taxon are of equal ecological importance, and that any species in the major taxa can be substituted for any other. The second is that the benthic environment is an unchanging environment with no variation and no changes in time. "Both assumptions are false. The assumption that species or smaller operational taxonomic units (OTUs) are unimportant and should be lumped into major taxa for analyses is not justified.... The

approach is simplistic, biased and lacking in rigor. It does not allow for an adequate description of the assemblage that will lead to any understanding of what is influencing either the type, the abundance or the biomass of organisms in the benthic community. "...measuring environmental change by recording only the changes in the major taxa will often give an untrue value for the change. "Likewise the assumption of an unchanging or steady-state community at equilibrium is also invalid."

#### Response

The major taxa approach was selected for use so that impact determinations could be made in an objective manner using statistical techniques with reasonable statistical power. Although it is true that the approach is simple and does not use all of the available information on benthic assemblages, it is not inconsistent with the bioassay evaluations in which a single endpoint (e.g., mortality) is evaluated instead of the numerous possible endpoints (e.g., growth, reproductive effects, physiological changes). The important criteria for selecting the test endpoints for both benthic evaluations and bioassays are:

- 1) the endpoints represent known responses to toxic chemicals;
- 2) they can be measured with acceptable levels of accuracy and precision; and
- 3) they are indicative of important detrimental effects in the environment. The major taxa approach satisfies all three of these criteria.

It is not assumed in the major taxa approach that all species within a major taxon "are of equal ecological importance," nor that species "are unimportant." It recognizes, however, that we have only a poor understanding of the ecological role and/or importance of most species, and that if we were to include information on each and every species' abundance, it would be difficult, if not impossible to reduce such a large body of data to evaluation criteria for assessing the effects of sediment contamination. It is also not true that there is an assumption in the major taxa approach of "an unchanging or steady-state community at equilibrium." If that were true, there would be no need for sampling and analyzing reference area conditions each time a new test area was investigated; instead, comparisons could just be made with historical conditions from a suitable reference area. Simultaneous sampling of reference and test areas is required to attempt to control for temporal variability in the benthic communities. While it is recognized that such comparisons are not always ideal, they are the best available means of attempting to take such factors into account.

#### Comment by Daniel Syrdal

**C-73.** "As set forth in previous comments, subsections (4) and (5) could simply reserved [sic] until the Department has developed appropriate regulations."

Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

This section of the rule makes it clear that Ecology will address "other deleterious substances" (as defined in Part II of the rule) in a manner appropriate to the circumstances and the materials being evaluated in any given case. It provides an important component to the flexibility of rule implementation and serves as a clear expression of Ecology's approach to other adverse sediment effects.

Comment by Thomas Aldrich

**C-74.** "WAC 173-204-320(4) and (5)...Ecology does not have the authority to reserve "case-by-case" review through rule-making. These sections should be deleted."

Response

Please see Ecology's response to comment C-73 above.

**WAC 173-204-330**

Comment by Daniel Syrdal

**C-75.** "These sections should simply be reserved. The Department should not be making determinations on a case-by-case basis until such time as it has developed meaningful information, methodologies, criteria, etc. through the promulgation of regulations."

Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure

Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

Comment by Thomas Aldrich

**C-76.** "These sections should be deleted, as Ecology cannot reserve the ability to determine "standards" through rule-making on a "case-by-case" basis."

Response

Please see Ecology's response to comment C-75 above.

**WAC 173-204-340**

Comment by Thomas Aldrich

**C-77.** "These sections should be deleted, as Ecology cannot reserve the ability to determine "standards" through rule-making on a "case-by-case" basis."

Response

Ecology's statement to "reserve" standards within the rule does not indicate that Ecology will be establishing "standards" outside the rulemaking procedures mandated by the Administrative Procedure Act, Chapter 34.05 RCW. The statement does however recognize Ecology's statutory authority to prevent and/or cleanup pollution of the environment on a case-by-case basis, and provides a placeholder for future rule-making.

Comment by Daniel Syrdal

**C-78.** "These sections should simply be reserved. The Department should not be making determinations on a case-by-case basis until such time as it has developed meaningful information, methodologies, criteria, etc. through the promulgation of regulations."

Response

Please see Ecology's response to comment C-77 above.



**WAC 173-204-350**

Comment by Daniel Syrdal

**C-79.** "The sediment quality standards inventory should be made available to any party requesting the same. It should be comprised of only data which is quality assured in accordance with WAC 173-204-600 and 610."

Response

The rule has been revised in section 350 to indicate that the inventory is available to the public on request from Ecology, and to indicate that only quality-assured data will be included.

Comment by Thomas Aldrich

**C-80.** "The introduction to WAC 173-204-350 should be amended to indicate that the inventory will be available to public not just federal, state and local agencies."

Response

Please see Ecology's response to comment C-79 above.

Comment by Thomas Aldrich

**C-81.** "This section should be revised to include a statement that all data used in the inventory system meet minimum QA/QC requirements in accordance with WAC 173-204-600 and 610...."

Response

Please see Ecology's response to comment C-79 above.

Comment by Parametrix

**C-82.** "The state standards inventory is listed as available to federal, state, and local agencies. This information should be available to any concerned party whether private or public."

Response

Please see Ecology's response to comment C-79 above.

Comment by Thomas Aldrich

**C-83.** "First, Part IV--Sediment Source Control-- should be renamed as "Part IV--Discharge Permit Requirements." As currently titled, this part of the regulation incorrectly indicates to the reader that it deals with source control generally.... It does not deal with nonpoint source control or control from any other source that does not have a discharge permit..."

Response

Though many of the requirements in Part IV of the rule currently relate to point source discharge permits, which is the current focus of source control activities relative to sediment contamination, the rule is applicable to nonpoint discharges and other discharges not subject to NPDES discharge permits (e.g., dredging activities per Section 410 (6)). Please see Ecology's response to comment B-122.

The title of this part of the rule has not been revised. **The introductory language to this portion of the rule has been revised to clarify the applicability to nonpoint and other sources.**

Comment by Daniel Syrdal

**C-84.** "This provision should clearly define the sediment management unit of the Department as the entity responsible for accomplishing the tasks set forth in this section."

Response

Ecology agrees with the need for trained staff to effect consistent and disciplined implementation of the rule. The critical work on refinement and validation of the technical tools within the rule will continue to be carried out by the Sediment Management Unit staff through fiscal year 93 (July 1993). The Sediment Management Unit will also begin a 3-year training program starting in early 1991 to provide centralized support and intraagency training. During this time, critical questions on implementation and rule interpretation will be directed by the Sediment Management Unit.

**Subsection (5)**

Comment by Dan Syrdal

**C-85.** "In subsection (5) of this section, the word "may" should be replaced by the word "shall". The factors delineated are factors

which should be taken into account in all cases in determining whether certain monitoring conditions are necessary or appropriate."

Response

The rule has been revised to replace the term "may" with the term "shall" in the referenced section.

**Subsection (6)**

Comment by Daniel Syrdal

**C-86.** "In subsection (6), the "as determined necessary" language should be expanded to indicate as determined necessary to prevent waste water discharge causing a violation of the applicable sediment standards."

Response

The rule has been revised to clarify that permit terms and conditions for wastewater discharge loading and maximum chemical concentrations required by the SMS shall be associated with preventing violations of the applicable sediment standards.

**Subsection (7)**

Comment by Daniel Syrdal

**C-87.** "Subsection (7) should remove the reference to creating a substantial potential to cause a violation. Not only is this term vague and ambiguous, but the Department's authority is limited to preventing violations of the standards or enforcing against those situations where violations occur."

Response

Ecology's authority to regulate discharges whenever there appears to be a "substantial potential to cause a violation of the applicable sediment" standards is derived from the state Water Pollution Control Act, Chapter 90.48.120 RCW.

Comment by Thomas Aldrich

**C-88.** "WAC 173-204-400(7). The phrase "a substantial potential" should either be defined or eliminated from this subsection, as it is both vague and meaningless.

Response

Please see Ecology's response to comment C-87.

Comment by Parametrix

**C-89.** "Adoption of this section as written will indicate that all sediment contamination is the result of NPDES permitted point source discharges. The source control section does not address how other sources of sediment contamination such as non-point runoff and groundwater will be managed. "(7) The phrase 'substantial potential' used in this and later section should be defined or omitted."

Response

Please see Ecology's response to comments C-83 and C-87 above.

**WAC 173-204-410**

Comment by Parametrix

**C-90.** "Will it be necessary for the recipients of a sediment impact zone or a sediment recovery zone to lease these areas from the Washington State Department of Natural Resources or other land owners?"

Response

The rule does not require that sediment impact zones or sediment recovery zones be leased from the respective landowner(s).

**Subsection (1)**

Comment by Daniel Syrdal

**C-91.** "Subsection (1) suggests the Department will eliminate the existence of all sediment impact zones whenever practicable. Practicable is not defined... So long as the discharger meets the requirements of AKART and complies with water quality standards and sediment quality standards, a sediment impact zone is appropriate."

Response

Ecology agrees that sediment impact zones will usually be appropriate when needed by a discharge meeting the requirements of

AKART and complying with applicable water and sediment quality standards. However, the location of the proposed SIZ relative to sensitive resources, and the potential for facility-specific adjustments to the discharge requirements, may require or allow for reasonable reductions beyond those established via the application of industry-wide (categorical) AKART requirements. **The rule has been revised to define the term "practicable" as considering the relationship between environmental effects, technical feasibility and cost.**

Comment by Thomas Aldrich

**C-92.** "The second sentence of WAC 173-204-410(1) should be eliminated. Dilution zones, including sediment impact zones, are specifically contemplated by state law. See RCW 90.48.520. Thus, Ecology has no statutory direction to "minimize the number, size, and adverse effects of all such zones" or to "eliminate the existence of all such zones whenever practicable." In addition, the phrase "whenever practicable" has no definition or guidance to decision-makers as to whether it is "practicable" to eliminate an impact zone."

Response

See response to comment by Mr. Syrdal above. The intent to eliminate SIZ whenever practicable is a re-expression of statutory goals to eliminate discharges, restore the aquatic environment, and protect environmental and human health by the eventual achievement of water and sediment quality standards. This intent is also consistent with the Puget Sound Water Quality Management Plan.

**Subsection (2)**

Comment by Dr. David Jamison

**C-93.** "If the regulations will not provide for landowner approval then they should provide for indemnification of the landowner for future liability if the SIZ is permitted."

Response

The potential for significant future liability for authorized sediment impact zones exists only if the maximum degree of contamination to be allowed from an authorized SIZ (the SIZmax criteria) is exceeded. Since the SIZmax criteria equals the degree of contamination that will trigger the need for cleanup (the Cleanup Screening Level (CSL)), liability for cleanup of a SIZ becomes an issue when the SIZmax criteria are violated. Ecology has determined that indemnification of the landowner

should not be addressed within the rule. However, Ecology is developing an interagency liability management agreement with the Department of Natural Resources via an ongoing Memorandum of Understanding process.

After careful review and discussion with the Office of the Attorney General, Ecology has determined that the rule will not require landowner approval before issuing a discharge permit with a sediment impact zone authorization. Landowner approval will not be required because it would inappropriately insert a state rule into the underlying legal relationship between the discharger and the landowner established by the permit.

The sediment impact zone authorization requirements within the SMS are based on a demonstration that a current discharge causes an exceedance of the sediment quality standards. Because sediment impact zones can be authorized in areas of historic sediment contamination, it is highly possible a sediment impact zone could be authorized in an area which has been or will be identified as a cleanup site. In these situations, Ecology believes the sediment impact zone process should not (and likely cannot) determine or restrict liability for historic contamination.

Comment by Daniel Syrdal

**C-94.** "...As set forth in the general comments, we would again request that the Department seek judicial resolution of this critical issue before implementing these regulations."

Response

See response to comment B-60 above.

**Subsection (3)**

Comment by Dr. David Jamison

**C-95.** "This section is not clear. How can a discharge that removes or disturbs sediment be given a SIZ? Won't the sediment be blown away? It is unclear what you were trying to do here."

Response

This subsection identifies that not only activities which cause an exceedance of the sediment quality standards but also activities which remove or disturb sediments which already exceed the sediment quality standards shall apply for a sediment impact zone.

The "removes or disturbs" reference was primarily pointed at identifying dredging and construction activities which resuspend sediments that later settle as not exempt from the sediment impact

zone authorization process. Ecology expects that in most cases the sediment quality impacts from dredging will not require a SIZ.

Sediment impact zone requirements for dredging and dredged material disposal activities are specifically discussed in Section 410(6). **However, the language in sections 110(1) and 410(3)(b) will be modified slightly to clarify that exposure or resuspension of sediments (instead of remove or disturb) which exceed, or otherwise causes or potentially causes surface sediments to exceed the applicable sediment quality standards may apply for a sediment impact zone.**

Comment by Richard Ford

**C-96.** "WAC 173-204-410(3)(b) (proposed) should be changed to read: 'The person's discharge activity ... or otherwise cause or potentially cause marine, low salinity, or freshwater surface sediments to exceed, the applicable sediment quality standards ... date of the discharge'."

Response

**After careful consideration and on the advice of the Office of the Attorney General, Ecology has decided to incorporate the suggested revision into the final rule.**

**Subsection (4)**

Comment by Dr. David Jamison

**C-97.** "Although you may not limit a SIZ authorization based on past discharges, the resulting surface concentration at the site for whatever reason must not exceed the SIZmax. Therefore if the existing level is near SIZmax, a SIZ could be authorized for very low levels of contamination. Conversely the lower the initial concentration, the higher the allowed contribution by the new source."

Response

As established within the proposed rule, sediment impact zone (SIZ) authorizations are based on the existing discharge quality and a demonstration that it results or will result in an exceedance of the sediment quality standards. Ecology believes the SMS should not limit a sediment impact zone authorization by the existing sediment quality in the receiving water except as it relates to (is caused by) the quality of the existing permitted, or otherwise authorized discharges.

Hypothetically, the existing sediment quality may exceed the SIZmax due to historic purposes, but regardless, a sediment impact

zone authorization should be possible. In this case, the SIZ authorization chemical concentration limits would be established and based on a demonstration of how the current discharge quality affects sediment quality (i.e., causes an exceedance of the sediment quality standards but not the SIZmax). Ecology believes the SIZ process must allow sediment impact zones where existing sediment quality exceeds the SIZmax and historic practices are the cause of the SIZmax exceedance. Cleanup requirements within the SMS are intended to address protection of sediment quality in these cases.

Comment by Eric Johnson

**C-98.** "The ports agree with the provisions of Section 410 (4), which state that sediment impact zone authorizations shall not be limited by contamination resulting from unknown, unpermitted or historic discharges."

Response

Ecology acknowledges the ports agreement with the provisions of section 410(4).

**Subsection (5)**

Comment by Parametrix

**C-99.** "(5)(c) Have 'all known, available and reasonable methods of prevention, control and treatment, and best management practices' been established for stormwater discharges?"

Response

Best management practices for stormwater discharges have been drafted by Ecology and are currently under review prior to final publication. Target date for publication of the Stormwater Management Manual for the Puget Sound Basin is July 1991, with anticipated adoption of a related stormwater rule in December 1991.

**Subsection (6)**

Comment by Eric Johnson

**C-100.** "...in 410(6)(e), the words "as determined by the department" should be deleted, and replaced with "consistent with the requirements of the Puget Sound dredged disposal analysis". This will clarify that the established PSDDA procedures and policies will continue to govern dredging and unconfined open-water disposal in Puget Sound."



Response

Section 410 (6)(e) of the rule has been revised to replace the phrase "as determined by the department" with the phrase "consistent with the requirements described in subsection (6)(a) above." The rule provides Ecology's commitment to continued implementation of the Puget Sound Dredged Disposal Analysis (PSDDA) via Section 410 (6)(a) and provides for formal establishment of the PSDDA requirements via Section 410 (6)(d).

Comment by George Ploudre

**C-101.** "Are dredged material activities not discharging into navigable waters subject to this code?"

Response

Only activities which affect sediment quality would be subject to the rule. This could include dredging (by resuspension or exposure of sediment contamination) or disposal return water flows, though upland disposal per se would not be subject to the rule.

**Subsection (7)**

Comment by Daniel Syrdal

**C-102.** "With respect to subsection (7), please see prior comments regarding the attempt by the Department to reserve case-by-case review authority rather than to resort to rule-making."

Response

**This section of the rule has been revised to clearly state that the source control standards are applicable even in cases where the sediment quality standards are reserved.**

Comment by Thomas Aldrich

**C-103.** "WAC 173-204-410(7). As explained above, Ecology cannot reserve case-by-case review authority pursuant to rule-making. This subsection should be deleted."

Response

Please see Ecology's response to comment C-102 above.

**WAC 173-204-415**

Comment by Richard Ford

**C-104.** "The final rule should contain explicit language in WAC 173-204-415 providing that the sediment impact zone model will only be used in the first permit cycle after rule promulgation to identify specific monitoring requirements."

Response

Determining the need for monitoring, the extent of that monitoring, and the preferred location and timing for monitoring stations will be a key initial use of the SIZ model. However, the model will also be used to establish a SIZ where a discharge is expected to exceed the sediment quality standards of Part III of the rule. This is specified in 90.48.520 RCW, which requires Ecology to issue a SIZ when permitting a discharge that will exceed sediment quality criteria. If field monitoring indicates that the modeling conclusions should be revised, the permit requirements will be adjusted as appropriate. The model is also essential to distinguishing between ongoing sources of sediment contamination and historic contamination of sediments when interpreting sediment sampling results. Accordingly, the rule has not been revised per this comment.

Comment by Eric Johnson

**C-105.** "Specifically, we suggest that section 415 of the draft rule include the following language: No sediment impact zone shall be authorized without a written agreement between the permittee and the landowner(s) affected; provided that, the State is authorized to enter into a covenant not to sue with the landowner which includes a provision that the landowner, by granting access to the permittee, is not an owner or operator of the property for the purposes of chapter 70.105D RCW."

"It is also very important for the department to insure that sediment impact zones are managed in such a way as to not require eventual cleanup."

Response

Regarding landowner approval of sediment impact zones, see response to comment B-60 above. Ecology agrees with the importance of managing SIZ to ensure that they do not result in the need for future cleanup. This is why the maximum degree of contamination to be allowed from SIZ's (i.e., the "SIZmax" criteria) will be at or below the degree of contamination that will trigger the need for cleanup (i.e., the CSL, or Cleanup

Screening Level). Management of the SIZ is also reflected in the need for discharge-related sediment monitoring and discharger accountability expressed via SIZ closure plans.

#### **Subsection (1)**

##### Comment by Dr. David Jamison

**C-106.** "I agree that every effort must be made to ensure that all methods of treatment are being utilized prior to issuing a SIZ. This means that cost should be secondary in providing treatment for removal of those specific contaminants that are likely to reach the sediments. In other words treatment of the waste stream prior to discharge is preferred over establishment of a SIZ."

##### Response

Ecology agrees that all known available and reasonable methods of prevention, control and treatment (AKART) are should be thoroughly identified and required before establishment of a sediment impact zone. Additionally, the proposed SMS identify a goal in section 410 (1) to minimize the number, size, and effects of authorized sediment impact zones, whenever practicable. This requirement goes beyond AKART to require discharge specific analyses to identify the reasonableness/practicability of reducing the size of, or eliminating sediment impact zones. The proposed rule recognizes that regardless of a discharge meeting AKART, which establishes categorical pollutant prevention, control and treatment requirements for similar discharge types, a sediment impact zone may be needed and may be authorized. The definition of which technologies are "reasonable", aside from cost considerations, requires some separate context of environmental need and significance. Therefore, the proposed SMS also require a specific discharge analysis of environmental need and significance in relation to the cost considerations of available prevention, control and treatment technologies.

##### Comment by Daniel Syrdal

**C-107.** "Subsection (1)(d) goes beyond the legislative authority given to the Department and puts several solid waste tests regarding waste reduction and recycling into the regulation. This simply has no place in this regulation"

##### Response

After consideration of this comment in coordination with Ecology's Water Quality Program, we believe the language in subsection (1)(d) should remain as proposed. The authority for these requirements is implicit in requirements to reduce with the intent

to eliminate all pollutants from permitted discharges as identified in the federal Clean Water Act and state water quality legislation. Further, these requirements are considered to be a restatement of AKART.

Comment by Thomas Aldrich

**C-108.** "Subsection (1)(d) should be revised to more accurately reflect the legislature's direction that discharges be provided with all known, available and reasonable methods of treatment and control prior to discharge into water of the state. The existing subsection (1)(d) takes liberties with this language and embellishes it with the phrases "has adequately addressed alternative waste reduction, recycling, and disposal options" and "to minimize as best practicable the volume and concentration of waste contaminants in the discharge."

Response

See response to comment C-107 above.

Comment by Parametrix

**C-109.** "(1)(c) How is the phrase 'in the public interest' defined? It seems logical that a sediment impact zone meeting the other specified criteria would be 'in the public interest' making section (c) redundant and confusing."

Response

The referenced subsection of the rule is a restatement of Chapter 90.54 RCW which specifies that any reduction in the quality of the waters of the state will be allowed only where it is clear that overriding considerations of the public interest will be served. This is one of the reasons for routinely requesting public comment on draft discharge permits prior to permit issuance. Standardized procedures for decisions regarding overriding considerations of public interest have not been established.

Comment by Daniel Syrdal

**C-110.** "...This provision [subsection (1)(i)] should be clarified to reflect a situation where a small increment of contamination is added by the discharge to an area which is just below the applicable sediment quality standards... This regulation should instead require that the incremental contribution from the source not violate applicable sediment quality standards outside the established sediment impact zone."

Response

**The rule language in subsection 415 (2)(a) has been deleted and consolidated in section 410 (4).** The consolidated language states that Ecology shall not consider contamination derived from unknown, unpermitted and/or historic sources when determining the need for a SIZ. This language addresses the case where discharge contamination occurs in an area with existing historic contamination. Please see Ecology's response to the similar comment C-97 above.

Comment by Richard Ford

**C-111.** "...Cost and feasibility are clearly recognized parts of any determination of whether a control technology should be required.... This concept, however, has not been incorporated in the proposed final rule. It needs to be made explicit in defining the site-specific area boundaries and maximum allowable sediment contamination level of a sediment impact zone. The appropriate language should be added to section 173-204-415(1) in the final rule."

Response

The consideration of costs and feasibility are included in the establishment of AKART and BMP's for a discharge. **In addition, the rule has been revised in section 415 (1)(f) of the rule** to define the term "practicable" as considering the relationship between environmental effects, technical feasibility and cost. Please see Ecology's response to comment C-91 above.

**Subsection (2)**

Comment by Eric Johnson

**C-112.** "...the references to port 'authorities' should be amended to read port 'districts'. Technically, this state does not have port authorities."

Response

**The rule has been revised to replace the term "authorities" with the term "districts."**

Comment by Daniel Syrdal

**C-113.** "Subsection (2)(a) should be changed to eliminate the phrase "substantial potential" as discussed above. In addition, the last sentence of this subsection should be clarified to indicate that such previous contamination shall not be considered in determining whether a permittee has violated sediment quality

standards or in determining what is required at the time of closure."

Response

Regarding the use of the phrase "substantial potential", see response to comment C-87 above. **The rule has been revised in Section 410(4) to clarify that unknown, unpermitted and historic sediment contamination will not be used in determining whether a discharge has resulted in exceedance of the sediment quality standards and/or violation of SI2 maintenance or closure requirements. The reiteration in section 415(2)(a) has been removed.**

Comment by Thomas Aldrich

**C-114.** "WAC 173-204-415(2)(a). The phrase "substantial potential" should either be defined or eliminated. In addition, the last sentence of subsection (2)(a) should be clarified to ensure that the reader understands...previous contamination will not be considered in determining whether a permittee has violated sediment quality standards and will not be considered at time of closure."

Response

See response to comment C-113 above.

Comment by Thomas Aldrich

**C-115.** "WAC 173-204-415(2)(b)(ii). The phrase "substantial potential" should be eliminated or defined."

Response

See response to comment C-87 above.

**Subsection (4)**

Comment by Daniel Syrdal

**C-116.** "The specific reference to "CORMIX" and "WASP" in subsection (4) of this section should be modified to recognize the likely changes in such models as experience by the Department is gathered... While an applicant should be allowed an opportunity to utilize the model, it may be necessary for the Department to provide the analysis results, as opposed to the discharger as set forth in this subsection."

Response

Rule language in section 130 (3) expresses Ecology's policy to modify rule methods, including sediment impact zone models, to accurately reflect latest scientific knowledge through ongoing experience and refinement. **The rule has been revised in Section 415(4) to indicate that Ecology, or the discharger as required by Ecology, will run the sediment impact zone model.**

Comment by Thomas Aldrich

**C-117.** "WAC 173-204-415(4). The specific reference to "CORMIX" and "WASP 4" should be deleted.... Instead the reference should simply be to "sediment impact zone models approved by the Department."

Response

The reference to WASP4 and CORMIX in the rule provides a necessary expression of Ecology's intent as to the standard for modeling sediment effects of discharges. These models were selected after extensive technical review and application to Puget Sound data. The identified models are publicly available and are supported by the Environmental Protection Agency. The rule language specifically allows the use of alternate models with the approval of Ecology.

Comment by Thomas Aldrich

**C-118.** "WAC 173-204-415(4)a)(iii). The reference to "CORMIX" and "WASP 4" should be deleted."

Response

See response to comment C-117 above.

Comment by Thomas Aldrich

**C-119.** "WAC 173-204-415(4)a)(b). Delete the reference to "CORMIX" and "WASP 4"."

Response

See response to comment C-117 above.

Comment by Thomas Aldrich

**C-120.** "...Ecology should recognize that there currently exist a number of dischargers who have had permitted discharges near each other for many years. It would certainly be inequitable, and probably would be illegal, to eliminate or drastically reduce

those existing discharges that otherwise meet state water quality requirements, because together they would have overlapping sediment impact zones which would "violate" applicable sediment impact zone maximum criteria. This subsection should be revised to reflect a grandfathering of existing discharges in this situation. At a minimum, each discharge should be modeled independently and determination made on the acceptability of the discharge as compared to the projected sediment impact zone regardless of the influence of the other discharges. This approach would only be used for existing discharges currently meeting all discharge requirements."

#### Response

It is Ecology's intent to regulate the effect of discharges on sediment quality towards the long-term goal of no adverse biological effects or significant human health risk, consistent with statutory mandates. To address important considerations of technical and economic feasibility, Ecology established the concept of "sediment impact zones" to allow for exceedance of the sediment quality standards. Recognizing that permitted discharges often occur in areas previously contaminated by other sources, Ecology decided to exclude consideration of historic or unpermitted sources of sediment contamination when authorizing SIZ's. And since multiple permitted discharges can often affect the same location in the sediments, Ecology decided to allow overlap among permitted SIZ's. These steps provide adequate acknowledgment of current discharge and sediment conditions, and provide sufficient flexibility in rule application. However, the net effect of the permitted discharges can not result in unacceptable environmental and human health risk, resulting in future cleanup actions. For these reasons, the rule limits the net effect of ongoing, permitted discharges at any given location in the receiving-water sediments. Ecology recognizes that some discharges may require a period of time before full compliance is achieved. Appropriate compliance times will be addressed during permit issuance.

#### Comment by Eric Johnson

**C-121.** "Finally, it remains very unclear how the waste load allocation process cited in Section 415(4)(b)(ii)(A) will specifically work. The rule must contain some explanatory detail of this process, and how it will be incorporated into the NPDES permits."

#### Response

Please see Ecology's response to comments B-74 and C-120 above.



Comment by Daniel Syrdal

**C-122.** "...Furthermore, there is no process set forth as to how such allocation would be done... Therefore, this subsection should be revised to reflect a grandfathering of existing discharges so long as each discharge was modeled independently and each met the requirements of these regulations when surface sediment contamination from other sources is not considered.

Response

Please see Ecology's response to comments B-74 and C-120 above.

Comment by Parametrix

**C-123.** "(4) Design Requirements. Use of the sedimentation models 'CORMIX' and 'WASP 4' as criteria to determine the 'source of the violation or potential violation' does not seem appropriate given the unproven reliability of these models. They are appropriate for screening, but should be subordinate to chemical and biological information.... If the standards specify programs to be used for analysis, then the programs must be available to applicants. Ecology should also provide technical support on the program, and provide training seminars on their use."

Response

Ecology believes the commenter has misinterpreted the intended use of the sediment impact zone models. The models are not necessarily intended to "determine" or confirm the source of existing or potential sediment quality contamination. Rather, Ecology's intent as expressed in the proposed SMS, is to use the models to "estimate the impact of any person's wastewater, or stormwater discharge on the receiving water and surface sediment quality...." In other words, Ecology is fully aware that existing sediment contamination may be the result of historical or unpermitted discharges that may be unrelated to any specific permitted discharge. Documented contamination may be used by Ecology in its determination to apply the sediment impact zone models to a particular discharge to identify predicted exceedances of the sediment quality standards, but it is not required.

Both CORMIX and WASP4 will be used in the sediment impact zone authorization process to identify discharges where exceedances of the sediment quality standards are expected and to provide an assessment of the size and severity of anticipated sediment impact zone areas using the best available information about the site and

discharge. The models will also be used to guide decisions regarding sediment impact zone monitoring density and frequency requirements.

Ecology selected CORMIX and WASP4 to identify and support the designation of sediment impact zones after conducting a regional workshop with modeling experts, follow-up review of promising models, and field testing of model at three case study site in Puget Sound which was summarized in "Recommended Sediment Impact and Recovery Zone Models."<sup>18</sup> CORMIX and WASP4 are fully supported by EPA with training programs, technical advice, and software updates.

#### **Subsection (5)**

##### Comment by Daniel Syrdal

**C-124.** "Subsection (5) should be modified to clarify that the required maintenance activities only relate to circumstances where sediment impact zone requirements have been violated."

##### Response

**The rule has been clarified to broaden the meaning of SIZ "maintenance requirements" to include all activities mentioned in 415(5). The rule already states that maintenance activities are premised on a "clear demonstration" of exceedance of sediment related permit requirements.**

##### Comment by Thomas Aldrich

**C-125.** "WAC 173-204-415(5). Subsection (5)(a) should set forth sediment impact zone monitoring requirements...and, thus be subject to public comment and judicial review. "Also, in subsection (5)(a), the phrase "substantial potential" should be deleted or defined."

##### Response

Regarding the specification of monitoring requirements in the rule, please see Ecology's response to comment B-62. Regarding the use of the phrase "substantial potential," see response to comment C-87 above.

##### Comment by Thomas Aldrich

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<sup>18</sup> "Recommended Sediment Impact and Recovery Zone Models" by PTI Environmental Services, published by the Washington Department of Ecology, January 1991.

**C-126.** "Subsection (5)(a) should be clarified to state specifically that sediment impact zone contamination triggering actions under this section specifically excludes historical contamination and contamination from sources other than the discharger entitled to the sediment impact zone being monitored...."

Response

**The rule has been revised to exclude the contamination derived from unknown, unpermitted and historic sources when determining appropriate response to exceedances of sediment-related permit conditions. See response to comment C-112 above.**

Comment by Thomas Aldrich

**C-127.** "Subsection (5)(a)(i). Specific reference to "CORMIX" and "WASP 4" should be deleted."

Response

Please see Ecology's response to comment C-116 above. **The rule has been revised to allow the use of other appropriate models with the approval of Ecology.**

Comment by Thomas Aldrich

**C-128.** "Subsection (5)(a)(ii)(D) and (E). The phrase "substantial potential" should be eliminated or defined."

Response

Please see Ecology's response to comment C-87 above.

Comment by Parametrix

**C-129.** "(5)(a) Maintenance requirements. The standards should specify a minimum level of monitoring that will be required for a sediment impact zone."

Response

Please see Ecology's response to comment B-120 above.

Comment by Parametrix

**C-130.** "(5)(a)(i) Use of models. It appears here that Ecology

will perform the modelling described. Currently, Ecology does not have this capability in-house. They will need to be able to model all potential discharges that could cause deposition in the sediment impact zone in question...."

#### Response

Section 415 (4)(a) of the rule indicates that modeling to establish a SIZ will be conducted by Ecology or the discharger as required by Ecology (please see Ecology's response to comment C-116 above). However, for purposes of establishing a "clear demonstration," Ecology will be conducting the necessary modeling.

Ecology has recently hired staff with experience in the cited models, and is in the process of implementing training programs for permit and technical support staff.

#### Comment by Parametrix

**C-131.** "(5)(a)(ii)(A) Surface sediment sampling. Sampling results must consider historical sources of contamination and historical levels of contamination at the sediment impact zone in order to show that the current sediment impact zone holder is the cause of the violation."

#### Response

The consideration of historical contamination will be an integral part of the evaluation described in the referenced subsection. One approach to this evaluation is to run the model to a steady-state condition, which eliminates the influence of historic contamination in the evaluation process. The rule phrase "due to the discharge" restates Ecology's policy to take action with the current discharge only when that discharge is responsible for the exceedance or violation.

#### Comment by Parametrix

**C-132.** "(5)(a)(ii)(A)(I) Area-weighted average. This section specifies that only three stations within a sediment impact zone will be used in an area-weighted average to compute the areal concentration. If more than three stations exist, then all stations should be used for area-weighted averaging using a polygon area associated with each station. The limit of only three stations gives inordinate weight to some stations, ignores spatial variability and could result in a sediment impact zone being effectively characterized by one hot-spot within the sediment impact zone."

#### Response

The referenced section of the proposed SMS addresses one of the methods by which the department may "clearly demonstrate" a violation of the sediment impact zone authorization or the sediment impact zone maximum criteria. The rationale behind the specific method discussed in subsection (a)(ii)(A)(I) is a weight of evidence approach to demonstrate the likelihood of contaminant concentrations which exceed the sediment impact zone maximum criteria or the SIZ authorization. Ecology believes use of three stations avoids characterization of the sediment impact zone based on one anomalous station. Additionally, the requirements of this subsection do not limit the department's ability to consider multiple stations within the sediment impact zone, but the stations must be combined three at a time.

Also, after consideration of comments received on the proposed SMS, Ecology has removed the concept of area-weighted averaging from the rule. The final rule was modified to simply require averaging of the three highest contaminated stations (for chemical contaminants) and comparison to the appropriate screening levels.

Comment by Parametrix

**C-133.** "(5)(a)(ii)(B) Monitoring data. Data that shows a chemical gradient towards the outfall should be paired with historical or baseline chemical data that indicated that the gradient was not there before the sediment impact zone was permitted. The monitoring should also extend upcurrent from the outfall to indicate that the gradient does not continue past the outfall."

Response

Where available, the information described in this comment will be considered during evaluation of sediment conditions near discharge sources, and could influence the demonstration described in this section. The rule identifies the gradient condition as one of several indications which may be used in conjunction with the modeling work to reach a "clear demonstration" conclusion.

Comment by Robert Burd

**C-134.** "P. 49 Line 6 'exceeds should be exceed'."

Response

The misspelling has been corrected in the rule.

Comment by Dr. David Jamison

**C-135.** "I agree that the landowners permission must be obtained prior to maintenance of a SIZ."

Response

Please see Ecology's response to comment B-60, B-73, C-93 and C-105 above. **The rule has been revised to remove the requirement for landowner approval of SIZ maintenance actions.**

Comment by Daniel Syrdal

**C-136.** "In addition, the requirement in subsection (5) (d) that written landowner approvals must be obtained prior to proposed maintenance actions could prevent the remedial activities associated with such actions. The Department should consider a provision providing for Department assistance in obtaining authority to conduct such maintenance activities if the landowner objects."

Response

The state Water Pollution Control Act, Chapter 90.48 RCW, states explicitly in section 090 that the Ecology has the right of entry at a site for the "purpose of inspecting and investigation conditions relating to the pollution or the possible pollution of any of the waters of the state." Thus, Ecology has statutory authority for right of entry for such activities as sampling, sediment impact zone evaluation and monitoring, and site cleanup.

**See response to comment B-60. The rule has been revised to allow Ecology to facilitate access to SIZ lands that require maintenance actions in cases where landowner objections exist.**

Comment by Richard Ford

**C-137.** "The final rule should clearly indicate that Ecology will not consider surface sediment contamination determined to be the result of unknown or unpermitted or historic discharge sources in determining whether the sediment impact zone maximum criteria are exceeded. The appropriate language should be added to WAC 173-204-415(5) (a) ."

Response

See response to comment C-112 above.

**Subsection (6)**

Comment by Eric Johnson

**C-138.** "In addition, the closure requirements of Section 415(6) do not really set forth closure requirements, but rather only describe conditions for requiring closure. The actual closure requirements should be described, as well as the policy that the sediment cleanup standards do not apply to sediment impact zones that have been properly closed."

Response

Although Ecology believes it is necessary to include closure planning requirements with a sediment impact zone (SIZ) application, Ecology does not intend to mandate any specific SIZ closure method. The intent of this requirement is to require the discharger to consider the method of SIZ closure, i.e., active vs. natural recovery with monitoring, and to identify the costs of these alternatives. A general policy statement within the rule identifies that where possible sediment impact zones should be reduced or eliminated (i.e., ratcheting), but this does not preclude unplanned closures due to unforeseen events. Ecology believes it is prudent to require upfront planning for eventual closure of the SIZ by the discharger. **Ecology will modify the proposed rule to clearly indicate the discharger is to identify the preferred method for SIZ closure and the associated costs as the closure planning requirements. The rule will also be modified to enable the dishcarger to select either active or natural recovery closure of authorized sediment impact zones.**

Comment by Richard Ford

**C-139.** "We do not believe that it is practical to include specific closure requirements in the sediment impact zone authorization....

Therefore, we suggest that WAC 173-204-415 (6) be changed to provide that Ecology will require within the sediment impact zone authorization that the discharger agree to close the sediment impact zone in accordance with a closure plan to be negotiated at the time of sediment impact zone closure. The section should enumerate what specific actions may be required in a closure plan for a sediment impact zone."

Response

Please see Ecology's response to comment C-138 above.

**WAC 173-204-420**

Comment by Thomas Aldrich

**C-140.** "The second sentence of the introduction of this section appears to be erroneous. We assume that what Ecology meant in this sentence is that if the Department determines that the standards of WAC 173-204-320 are or will be exceeded (and not the standards "of this section", then the Department can authorize a sediment impact zone to meet the standards of WAC 173-204-400 through 420.

Response

The rule is correct as proposed. If modeling and/or monitoring indications show the potential for exceedance of the SIZmax criteria of section 420, the discharge will require a SIZ (if it does not already have one) or may require modification of the existing SIZ authorization to specify permit requirements that will allow the SIZmax criteria to be met.

Comment by Thomas Aldrich

**C-141.** "WAC 173-204-420(1). See previous comments on Ecology's ability to set rule-making for Puget Sound only or for non-Puget Sound marine sediment. See also our previous comments on Ecology's inability to reserve the right to determine sediment standards and criteria on a case-by-case basis."

Response

Regarding rule applicability to Puget Sound, please see Ecology's response to comment C-25 above. Regarding case-specific decisions on sediment standards, please see Ecology's response to comment B-77 above.

Comment by Parametrix

**C-142.** "(1)(a) Applicability. The various criteria listed in this paragraph should be referenced with the appropriate WAC and section where the criteria are given."

Response

**The rule has been revised to indicate that all the referenced criteria are contained in subsection 420 of the SMS.**

Comment by Eric Johnson

**C-143.** "...Section 420(2) should be revised to more clearly correlate to this policy, however." (SIZ authorizations shall not be limited by contamination resulting from unknown, unpermitted or historic discharges.) "In Section 420(2), the reference to



'discharge' should be changed to 'permitted discharge', and the exceptions should also reference the provisions of WAC 173-204-410 (4)."

#### Response

**The rule has been revised to add the phrase "permitted or otherwise authorized" to the referenced subsection.** The phrase "due to a (permitted or otherwise authorized) discharge" provides appropriate restatement of the exclusion of historic and unpermitted sources as described in section 410 (4).

#### **Table II**

##### Comment by Dr. Philip Dorn / Dr. Charles Meyer

**C-144.** "Sediment impact zone maximum chemical criteria are arbitrarily set. The criteria in Table II for sediment impact zone maximum chemical levels are not justified.... For no apparent reason, the second, rather than the highest values are used for this table. The Department of Ecology should consider providing more flexibility in the allowable chemical concentrations for impact zones.... We would suggest that if the zone is considered impacted and defined by the Department of Ecology on a site specific basis, a 10X AET criteria be used. This would be consistent with the concept of "application factor" and other principles of EPA's water quality based approach to toxics control...."

#### Response

Use of the highest AET was one of the alternatives considered for setting the  $SIZ_{max}$ , MCUL, and CSL, along with the lowest AET, the second lowest AET, and the severe effects AET. The EIS evaluated the environmental impacts of these alternatives, and concluded that the highest AET and the severe effects AET had significant long-term environmental impacts. The lowest AET alternative was considered to have significant short-term environmental impacts (during remedial action). This evaluation was one of the primary factors in choosing the second lowest AET as the preferred alternative for setting  $SIZ_{max}$ , MCUL, and CSL levels.

As discussed on page 2-16 of the EIS (Potential Alternatives Dropped from Consideration), multiples of AETs were initially considered as potential alternatives for setting  $SIZ_{max}$ . However, both Ecology and the SMS Workgroup believed that sediment quality standards should be directly correlated to specific levels of biological effect, rather than arbitrarily selected multiplicative factors of the sediment quality standards. A 10x AET approach would, for over 70 percent of the contaminants being regulated,

result in sediment quality standards that were higher than the severe effects AET alternative considered in the EIS. Based on the environmental impacts associated with the severe effects AET alternative, such an alternative would not meet the environmental protection goals of the implementing legislation.

Comment by Daniel Syrdal

**C-145.** "Footnote 1 to Table II has the same problems associated with Footnote 1 to Table I discussed above."

Response

Please see Ecology's response to comment C-61 above.

Comment by Thomas Aldrich

**C-146.** "WAC 173-204-420(2). Table II should be revised, as it is overly conservative."

Response

Please see Ecology's response to comment B--94 above.

Comment by Thomas Aldrich

**C-147.** "WAC 173-204-420(3). Generally, our previous comments on WAC 173-204-320 apply to this section as well."

Response

Please see Ecology's response to comments C-66 and C-67 above.

Comment by Thomas Aldrich

**C-148.** "WAC 173-204-420(3)(iii)(A) and (B). The 30% figure used in this subsection seems unreasonably conservative.... A more reasonable approach would be to accept a benthic population, including amphipods, that are one-half of the acceptable criteria set forth in WAC 173-204-320. Therefore our recommendation is that after the criteria of section 320 are developed and finalized, this section should be developed based upon one-half of the standards set forth in chapter 320."

Response

In general, the SIZmax biological response criteria are already established at twice the allowable degree of adverse effect described by the SQS. While only one biological test can show adverse effects before the SQS are exceeded, two tests must show

adverse effects for exceedance of the SIZmax. For benthic abundance, the SQS uses a 50% decrease in one major taxa; the SIZmax criterion is two taxa showing a 50% decrease. For larval tests, a 15% mortality/abnormality is doubled to 30%. For amphipod mortality, the SQS uses an absolute value of 25%, while the SIZmax is based on an increase of 30% relative to reference. Since reference mortalities can often reach 15-20%, the net SIZmax value (45-50% absolute) is comparable to a doubling of the SQS values. For worm biomass, the 30% decrease of the SQS is converted to a 50% decrease for the SIZmax. This is less than twice the SQS value, however, the SQS value was adjusted upwards from 20% (as calculated during the original technical development work) to the 30% value to accommodate concerns about the more recent developmental status of this test.

Further increases in the allowable adverse effects in sediment impact zones would not ensure the necessary protection of environmental and human health. The approach taken in defining SIZmax is also consistent with the technical evaluations and regulatory decisions made during development of the Puget Sound Dredged Disposal Analysis, which provides for coordinated regulation of discharge sources and navigation dredging. Additional reasons for this approach are described in the SMS Environmental Impact Statement.

Comment by Thomas Aldrich

**C-149.** "WAC 173-204-420(3)(iii)(C). See our previous comments to WAC 173-204-320 (3)(c). The benthic abundance test should be one-half of that acceptable under 320(3)(b)."

Response

As indicated in the previous response to Mr. Aldrich above, the SIZmax benthic abundance criterion is twice the effects level established for the sediment quality standards of section 320. Also see Ecology's response to comment C-67 above.

Comment by Parametrix

**C-150.** "(3) See comments for WAC 173-204-320. All comments apply here as well. The proposed test criteria are too stringent to be effective."

Response

Please see Ecology's responses to the two comments by Mr. Aldrich above. Also, see Ecology's response to comments C-71 and C-72 above. And see Ecology's response to comment B-94 above.

Comment by Thomas Aldrich

**C-151.** "WAC 173-204-420(4) and (5). See our previous comment regarding Ecology's authority to reserve the setting of standards and criteria on a case-by-case basis."

Response

See response to comment B-77 above.

**WAC 173-204-510**

Comment by Daniel Syrdal

**C-152.** "There is no definition for "station clusters" which provides any limitation on the size or other characteristics of the cluster. "Contiguous" is the only limitation and that has no geographic bounds. Such limitations should be developed in order to make this section workable. Secondly, there is no way for station clusters of low concern to get off the inventory. While the Department may want to keep all stations on a inventory if the only purpose of the inventory is for future reference, the regulation should make it clear that presence on the inventory in no way implies any site clean-up responsibilities. Failure to do so could make various property transfers and other necessary commerce very difficult."

Response

The definition of "contiguous" stations has not been included in the rule due to the wide range of contamination area extent, contamination types, and sampling patterns observed in the Puget Sound sediment database. As discussed with the SMS Workgroup, the definition of "contiguous" considers evidence of a contamination link between stations and have a reasonable physical proximity in consideration of the sources and hydrodynamics of the area environment. Ecology is currently incorporating these considerations into rule implementation guidance for identifying contiguous stations and defining stations clusters. This guidance will be reviewed by the SMS Implementation Committee before it is finalized.

Ecology will keep stations and station clusters that exceed the sediment quality standards of section 320-340 on the inventory established in section 350. In addition to use as benchmark, the inventory will be used to assist in prioritizing source control needs and for other program uses as indicated in section 350. Section 510 (1) states that "no further cleanup action determinations shall be taken by the department" for station

clusters of low concern (unless new information requires a reassessment of the screening conclusions).

Comment by Thomas Aldrich

**C-153.** "There are two major problems with this section. First, there is no guidance provided as to how it will be determined that stations are "contiguous.".... Likewise, there is no justification given as to why only three stations within a station cluster will be used."

Response

Regarding the definition of "contiguous stations," see response to comment by Mr. Syrdal above. Regarding the reasons for using three stations within a station cluster for screening purposes, see response to comment B-29 above.

**Subsection (2)**

Comment by Thomas Aldrich

**C-154.** "There appears to be a discrepancy between subsections (2)(d) and (e) as compared to (f).... This means that there could be a situation in which there are biological effects above the cleanup screening level at one or more stations but not at all three of the stations identified in WAC 173-204-510(2)(c) so that the area does not fall into either the "potential concern" category or the "low concern." These sections need to be made consistent."

Response

The rule has been revised to indicate that when the average chemical concentration of the three stations is below the CSL chemical criteria, and 1 or 2 (but not all 3) of the stations are above the CSL biological criteria, the stations cluster will be defined as a "station cluster of low concern."

Comment by Daniel Syrdal

**C-155.** "Again, subsection (2) (g) of this section lacks the pertinent standards which are not developed."

Response

See response to comment C-38 above.

Comment by Robert Burd

**C-156.** "Use of best professional judgment should be acknowledged and highlighted as an absolute necessity in the implementation of these Standards. A good example is the selection of station clusters from "contiguous" stations. Due to site specific factors it is impossible to provide working definitions of terms such as contiguous."

Response

Ecology agrees with the need for best professional judgment in the selection of contiguous stations and the definition of station clusters. Please see Ecology's response to comment C-152 above.

Comment by Parametrix

**C-157.** "(2)(a and b) Station clusters. It is not stated why only three stations are used in the analysis. Given the extremely high spatial variability of the chemical data, associating an area with only three stations when more stations are available within the area of interest is not scientifically sound. In essence, the method selects high outliers for analysis and ignores the bulk of the data. This is the reverse of common scientific and statistical methods. "The method also puts too much emphasis on older data, that in many cases can not be reproduced in further sampling events. There is no mechanism to allow new data to supersede older data. If the new data is cleaner than the older data at the site, the process of selecting the three highest concentrations essentially eliminates the new data from the analysis. There should be a method of allowing new data to supersede old data in the state inventory and in the station cluster. "WAC 173-204-510 states: 'A station cluster is defined as any number of stations ... that are determined to be contiguous.' It is not stated how stations were determined to be contiguous or what criteria was used to determine which stations were contiguous enough to be included in a cluster. This is a serious flaw since the grouping of stations determines how much area will fall within a site under Section 540. Since the clean-up criteria is determined from only three of the stations in a cluster (site), then a large grouping of stations essentially eliminated many stations from the analysis leaving only the three most contaminated stations for analysis. No justification is provided for this bias."

Response

The use of three stations is designed to eliminate one or two anomalous stations during the screening process. After a site is identified, all stations are considered in ranking the site, in evaluating cleanup alternatives and in defining the site boundary.

Regarding the use of "current data" following re-sampling, please

see Ecology's response to comment B-29 above.

Regarding the definition of "contiguous" please see Ecology's response to comment C-151 above.

#### **Subsection (5)**

##### Comment by Daniel Syrdal

**C-158.** "Subsection (5) of this section would seem to allow a requirement for additional monitoring of any station or group of stations upon the re-issuance of the inventory. This would seemingly provide the Department with an unfettered discretion to require whatever monitoring it may like to expand its inventory even when no clusters of potential concern are identified. This would be inappropriate."

##### Response

**Section 510(5) will be revised to clarify the intent of the department to initiate or require monitoring to address ongoing or potential pollution of sediment quality under the circumstances identified.**

#### **WAC 173-204-520**

##### Comment by Thomas Aldrich

**C-159.** "In general, our previous comments with regard to WAC 173-204-320 apply to this section as well. In addition, our previous comments with regard to Ecology's ability to differentiate between marine sediment cleanup standards for Puget Sound and for non-Puget Sound marine sediment areas applies here. Likewise, our previous comments with regard to Ecology's ability to reserve the setting of standards on a "case-by-case basis" applies to this section as well."

##### Response

Please see Ecology's responses to comments C-66 and C-67 above. Also see Ecology's response to comment C-42 above. And see response to comment number B-77 above.

##### Comment by Daniel Syrdal

**C-160.** "In general, our previous comments with respect to WAC 173-204-320 would apply to this section as well. The same procedural questions are pertinent regarding Ecology's ability to reserve the setting of standards on a case-by-case basis and other procedural issues. In addition, the limitations and concerns regarding biological testing also apply."

Response

Please see Ecology's responses to comments C-60, C-61, C-68 and C-73 above. Also see Ecology's response to comment B-77 above.

Comment by Thomas Aldrich

**C-161.** "Table III, Puget Sound Marine Sediment Cleanup Screening Levels and Minimum Cleanup Levels--Chemical Criteria, is based on AET's and thus should be revised in accordance with the general comments set forth...above...."

Response

Please refer to Ecology's responses to the following similar comments: comments A-10, A-11, A-34, B-13, B-21, B-31, B-53, B-85, B-110, and B-111.

Comment by Thomas Aldrich

**C-162.** "WAC 173-204-520(3)(d)(iii). This subsection should be revised to be consistent with our previous recommendation for revision of WAC 173-204-320(3)(c)."

Response

For the reasons discussed in comments C-46, C-56, and C-58 above, it is not considered appropriate to abandon the performance standard for benthic abundance. A change in a benthic community that is both statistically significant from a reference area and that includes a greater than 50 percent reduction in the abundance of one of the three major taxa is a substantial adverse effect that should be protected against. The proposed changes to this measure would considerably complicate the assessment of benthic abundance without improving the chances of detecting adverse effects, should they occur.

Comment by Parametrix

**C-163.** "(3) See comments for WAC 173-204-320. All comments apply here as well."

Response



Please see Ecology's responses to comments C-64, C-65, C-71 and C-72 above.

#### **WAC 173-204-530**

##### Comment by Richard Ford

**C-164.** "WAC 173-204-530 should state that the initial site list will be screened to ensure consistency with existing information and professional judgment. Phasing in the rule would also give Ecology more time to train staff and provide for consistent and disciplined implementation of the rule."

##### Response

The rule has been revised to require Ecology to ensure that data used in sediment quality designations and inventory, and in sediment regulatory and management actions, be of acceptable quality. In addition, the rule has been revised to require that all data available to Ecology be considered in application of the rule. The rule provides sufficient flexibility (e.g., section 130 (4)) to allow Regarding phasing in the rule, please see Ecology's response to comment B-24 above.

#### **Subsection (4)**

##### Comment by Dr. David Jamison

**C-165.** "I see no reason why the contribution of a SI2 to the contamination of the sediment should not be taken into account in determining whether or not cleanup is needed. If it is above the Standard for any reason it should be cleaned up. This section should be removed."

##### Response

Please see Ecology's response to comment C-97 above.

#### **Subsection (5)**

##### Comment by Daniel Syrdal

**C-166.** "Subsection (5) of this paragraph should not limit the area weighted average chemical concentrations to those of the three highest stations within a cluster. While this may be appropriate for purposes of screening, as set forth in WAC 173-204-510, it is not appropriate in defining clean-up sites... In addition to that concern, subsection (5) would also seem to have two inconsistent

subsections. Subsections (c) and (d) would seemingly be contrary to each other in many cases... which would govern?"

Response

Please see Ecology's response to comment number 29 above. The use of three stations is appropriate when defining cleanup sites since a portion of the site may require active cleanup and the remaining area of the site may qualify for a sediment recovery zone. Subsections 530 (5) (c) and (d) are not inconsistent in that they refer to two different cases. Subsection (c) pertains to a case where the chemical indications of the presence of a site are not confirmed by biological testing information, allowing biological testing to overrule the indications of chemical testing (per subsection (b)). Subsection (d) pertains to a case where the biological testing information indicates the presence of a cleanup site.

Comment by Parametrix

**C-167.** "(5)(b and c) Station clusters. As written it appears that all stations in a station cluster of concern identified in Section 510 are included in the area-weighted average of a site for hazard assessment purposes. In part 5(c), however, the use of only three stations are specified for biological effects. As with the chemical data, the use of only the three worst case stations is not scientifically valid for characterization of any area for which additional information is available. The wording between the sections is ambiguous."

Response

**Subsection (b) has been revised to clarify that averages for different chemicals are conducted on only three stations at a time. See response to comment by Mr. Syrdal above.**

**WAC 173-204-540**

Comment by Daniel Syrdal

**C-168.** "Subsection (2) of this section should be amended to clarify that the reference to "sites identified by the procedures in section 530" refer to "clean-up sites" identified by such procedures."

Response

**The rule has been clarified by adding the term "cleanup" before the word "site" in the first sentence.**

WAC 173-204-560

**Subsection (1)**

Comment by Dr. David Jamison

**C-169.** "What is the nature of the "written approval"? Is it a consent decree? What is the timeframe for response?"

Response

This section does not limit the nature of Ecology's "written approval" of the cleanup study and cleanup report. Ecology expects it will issue such written approvals in a variety of ways based in part on the type of cleanup action and authority selected if Ecology requires cleanup. Such written approvals could be simple form letters or consent orders or decrees. Because Ecology expects such a diversity of cleanup types and authorities, no definitive timeframe has been established for Ecology's issuance of a written approval or disapproval letter within the requirements of this section and section 580, Cleanup action decision.

**Subsection (4)**

Comment by Eric Johnson

**C-170.** "...In order to avoid unreasonable study costs or expectations, Section 560 (4)(d) should be amended so that only activities or discharges reasonably related to, or under the control of, the party or parties responsible for the sediment contamination should be included in the cleanup study."

Response

Referenced section of the rule allows Ecology to require that information on all possible contamination sources be obtained during the cleanup study. Because of the close relationship between source control and sediment cleanup, this information will often be important when determining the extent, type and timing of cleanup actions. **The rule has been revised to clarify that source control information will be obtained by Ecology from the responsible dischargers.**

**Subsection (7)**

Comment by Dr. David Jamison

**C-171.** "What is the nature of the "written authorization"? You need a statement on the timeframe in which you would respond to plans."

Response

This section does not limit the nature of Ecology's "written approval" of the cleanup study and cleanup report. Ecology expects it will issue such written approvals in a variety of ways based in part on the type of cleanup action and authority selected if Ecology requires cleanup. Such written approvals could be simple form letters or consent orders or decrees. Because Ecology expects such a diversity of cleanup types and authorities, no definitive timeframe has been established for Ecology's issuance of a written approval or disapproval letter within the requirements of this section and section 580, Cleanup action decision.

**WAC 173-204-570**

**Subsection (3)**

Comment by Daniel Syrdal

**C-172.** "Subsection (3) indicates that the minimum clean-up level requires certain chemical concentrations and biological effects to be achieved by year 10 after completion of the active clean-up action. This should be clarified in cases where no active clean-up action, other than source control and natural recovery, is necessary to meet these standards within ten years. Subsection (3)(b) should provide some flexibility for cases where the chemical criteria are met, biological effects criteria are exceeded, but the actual biological situation at the site is obviously providing good diversity and abundance of species. Given the problems associated with some of the biological effects tests, the minimum clean-up level should take into account the possibility of exceeding some biological test and still meeting the minimum clean-up level."

Response

The rule has been revised to clearly state that the 10-year period is associated with the application of the MCUL in establishing a site-specific cleanup standard, and does not constrain appropriate

**time frames for SRZs or cleanup actions.** Regarding conflicting results between benthic studies and bioassay, please see Ecology's response to comment C-31 above.

#### **Subsection (4)**

##### Comment by Daniel Syrdal

**C-173.** "Subsection (4) of this section fails to recognize the possibility that even though the minimum clean-up level is not met for a particular clean-up action, to do so would result in net adverse environmental affects [sic]. While the net adverse environmental [effects] are required to be considered, nowhere does this regulation state that a responsible party should not conduct a clean-up action having a net adverse environmental impact if such action is necessary to meet the minimum clean-up levels within 10 years."

##### Response

Though the MCUL is applied with a 10 year recovery period in order to define the areal extent of the cleanup site, the rule does not mandate a 10 year recovery period for all sediment cleanup actions, nor does it discourage selection of remedies and/or mitigation actions that will reduce the adverse effects of cleanup actions. These features, in combination with administrative policies in Part I of the rule, provide the necessary additional flexibility to address a case where the severity or imbalance of net environmental effects require additional consideration.

#### **WAC 173-204-580**

##### Comment by Daniel Syrdal

**C-174.** "This section does not distinguish between voluntary and other forms of clean-up action in its requirements. Unlike the clean-up standards procedures under the model toxics control act, voluntary clean-up actions still are required to meet all of the requirements of a forced clean-up action. One of the major incentives for conducting voluntary clean-up actions is to avoid much of the time and added expense associated with all of the procedural requirements of the mandated clean-up. We would recommend that these regulations also provide similar incentives for voluntary clean-up actions."

##### Response

Because active cleanup in the aquatic environment requires a federal permit and Ecology water quality certification (with the

exception of federal superfund cleanup actions), the minimum procedures for voluntary cleanup are defined by pertinent federal rules. The SMS rule does not substantively add additional procedural requirements to this process. Rather, the SMS cleanup decision process was developed with the intent to add the minimum necessary technical and substantive requirements, relying on the existing requirements of other rules to dictate procedural flow.

Comment by Daniel Syrdal

**C-175.** "The language requiring a responsible party to "obtain written land owner's approval" should be revised to indicate that access to the area in question will be obtained either voluntarily or involuntarily, from the landowner. It will unnecessarily delay, and perhaps stop, clean-up activity if landowners' approval must always be obtained. The regulation could be neutral on this question, similarly to what is done regarding approval of sediment impact zones. Additionally, the regulation should consider the possibility of Department assistance in obtaining access to the site when necessary for implementing an approved clean-up plan. The Department could utilize its authority for such access under the Model Toxics Control Act."

Response

Under the Model Toxics Control Act, Chapter 70.105D, the party responsible for granting access to a site is usually at the table as they are considered a potentially liable party, and are generally dealt with under some form of consent order. The very nature of consent orders automatically facilitates access to a site. **The rule has been revised to delete the requirement for landowner approval of active sediment cleanup. The rule now includes language indicating that Ecology may facilitate access as necessary to ensure cleanup.**

Comment by Thomas Aldrich

**C-176.** "The language "obtain written landowner's approval" should be revised to indicate that access to the area in question will be obtained, either voluntarily or involuntarily, from the landowner. It will unnecessarily delay, and possibly stop, cleanup activity if written landowner's approval must always be obtained. Such approval is not required by statute and should not be placed as a requirement in this regulation."

Response

Please see Ecology's response to comment 175 above.

**Subsection (1)**

Comment by Dr. David Jamison

**C-177.** "To the extent that a SIZ will remain in an area being cleaned up and you won't allow for landowner approval, there must be some form of indemnification by DOE of the landowner for subsequent contamination by the SIZ."

Response

Please see Ecology's response to C-93 above.

**Subsection (2)**

Comment by Dr. David Jamison

**C-178.** "You need to add an illustration to the statement about net environmental effects. Removal of eelgrass beds to dredging up or capping sediments may not be in the best long term interest of the environment if the altered site will not allow successful reintroduced of eelgrass. For example, it may be preferable to allow natural recovery to take longer than 10 years if it would mean not damaging the existing beds."

Response

Ecology agrees that an illustration would be helpful but prefers to include the proposed illustration and other illustrations in implementation guidance documents specific to source control or cleanup issues.

Section 570 of the SMS identify that cleanup standards may be selected via consideration of net environmental impacts, technical feasibility and cost. Considerations of natural recovery periods are limited to 10 years in the selection of a cleanup standard that would be protective of the environment and human health. Selection of a cleanup alternative under the requirements of section 580 (2) requires the selected alternative to meet the identified cleanup standard(s) and provides for consideration of net environmental impacts, technical feasibility and cost but does not limit remedial design natural recovery periods to 10 years. Therefore, the proposed rule allows case-by-case selection of a remedial design that may allow natural recovery e.g., to protect eelgrass beds to take longer than 10 years.

Comment by Daniel Syrdal

**C-179.** "Finally, subsection (2) of this section again states that in no case may a selected clean-up alternative exceed the minimum clean-up level at year ten after completion of the active clean-

up action decisions consider net environmental effects. Again, it is incongruous to suggest that, where net adverse environmental effects will occur, a clean-up which will meet the standards at year ten must be accomplished... Perhaps one means to deal with this question is to determine that sediment recovery zones could be allowed for more than a ten year period as a means to meet the minimum clean-up level when a net adverse environmental effect would otherwise occur."

Response

See response to comment B-32 above.

**Subsection (3)**

Comment by Dr. David Jamison

**C-180.** "A sediment recovery zone is different than a sediment impact zone. A SRZ is a recognized storage site for contamination. As such it must have the landowners permission. The landowner might want it removed instead of stored because future land use opportunities could be reduced or eliminated by the presence of a contaminated sediment storage site. It is the same as a cleanup action requiring owner approval. A SIZ is an interim situation not a final solution as is a SRZ. "

Response

Regarding landowner approval of sediment management decisions, please see Ecology's response to comment B-60, B-93, C-93, and C-105 above. Ecology considers sediment recovery zones as interim sediment "dilution" zones resulting from a cleanup action.

**WAC 173-204-590**

Comment by Daniel Syrdal

**C-181.** "This section does not set out with any clarity the purpose, temporal extent, and other relevant factors regarding the sediment recovery zone. These clarifications should be made so that it can be readily determined when such zones are appropriate and for what length of time they may be approved."

Response

The rule has been revised in the definitions section (Part II) to clarify that sediment recovery zones are the consequence of application of the sediment cleanup decision process resulting in cases where the site-specific cleanup standards exceeds the



**sediment quality standards of Part III.** This is why most of the requirements pertinent to evaluation of sediment recovery and determinations concerning the need for and extent of a sediment recovery zone are contained in other sections of Part V of the rule.

**WAC 173-204-600**

Comment by Daniel Syrdal

**C-182.** "This section should be modified to include provision, through existing Departmental authority, for the Department assisting a responsible party in obtaining access for sampling where necessary."

Response

**The rule has been revised to allow Ecology to facilitate access to lands where sampling is required by Ecology.** For further explanation on the issue of facilitating access please refer to Ecology's response to Mr. Syrdal's comments in sections 415(5) and 580.

Comment by Robert Burd

**C-183.** "The submitted sampling and analysis plan should include chemistry methods of analysis."

Response

**The rule has been revised to require sampling plans to include a description of methods of chemical analysis and biological testing.**

#### **D. WRITTEN COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT**

**Dr. David Jamison**

##### Comment

**D-1.** "Under land use you should mention that it is not only the environmental side of land use, but the economic as well. Contaminated sediment storage on land may substantially reduce its suitability for other economic uses. This should be discussed in the general discussion on "Impacts on the Human Environment for Residual Contamination", pages 5-11, as well as page 5-25."

##### Response

The potential economic impacts to land use that would result from sediment impact zone authorizations were addressed in the draft EIS. A statement clarifying that the land used to store sediments removed during a cleanup action may not be suitable for other economic uses has been added to the final EIS.

##### Comment

**D-2.** "There should be a discussion of the potential impact upon the liability of the state through DNR for continued location of contaminated sites on state owned aquatic lands for SIZ or SRZ. This would be appropriate under the "Programmatic Impacts" section at page 5-27."

##### Response

A key purpose of the rule is to recognize the potential effects of discharges and residual contamination, and to limit those effects and associated liabilities by keeping SIZs and SRZs at or below contamination levels that would require future cleanup. The rule also clearly allocates accountability, such as monitoring, to responsible parties. These features will reduce "programmatic impacts" of the rule.

Ecology and DNR are currently discussing this issue and the agreement reached will be documented in the form of a Memorandum of Understanding between the two agencies. Ecology acknowledges that DNR is the trustee for state owned aquatic lands, and that contaminated sediment sites, SIZs, and SRZs may be located on these lands. As such, the state through DNR may be affected by the continued location of contaminated sediments on state owned aquatic lands either after the implementation of cleanup activities, or as authorized under a SIZ or SRZ.

Comment

**D-3.** "You need to discuss under the Washington Aquatic Lands Act section (p7-8) the need for the state to agree to SIZ and SRZ on state land through an authorization document such as a lease."

Response

Ecology and DNR are currently discussing this issue and the agreement reached will be documented in the form of a Memorandum of Understanding (MOU) between the two agencies. DNR will be provided the opportunity to review and comment on proposed SIZ and SRZ permits, as will all affected landowners (173-204-415(2)(e)(viii)), before they are authorized.

Comment

**D-4.** "In the introduction to both the 'Sediment Impact Zone Case Studies' and the 'Cleanup Case Studies' you must indicate that the data used were old data and may not represent the currently existing situation at the sites under review. In addition the case studies are for illustration purposes only and don't represent what the actual findings by DOE may be in the future."

Response

Statements to this effect have been added to the introduction to the Sediment Impact Zone Case Studies and Cleanup Case Studies sections.

**Pat Petuchov**

Comment

**D-5.** "Alternative #2, the preferred alternative as discussed in the EIS, is the choice we are supporting. It should be added that Alternative #1, although economically and practically not as feasible, is the ultimate goal in the best of all worlds. I would have preferred to see a fifth alternative: a merger between alternatives #1 and #2."

Response

Ecology acknowledges Mr. Petuchov's support of Alternative #2.

After careful consideration and as a result of several discussions with the SMS Workgroup, Ecology limited the in-depth evaluation of

the alternatives to the four alternatives that are identified in the EIS. A fifth alternative, defined by Mr. Petuchov as a merger between Alternatives 1 and 2, was not identified as a preferred alternative warranting further evaluation by either Ecology or the Workgroup. Further, Ecology believes that defining the minimum cleanup level (MCUL) and the SIZ maximum allowable contamination level at the contamination level identified in Alternative 2 will help to provide the SMS with the degree of flexibility necessary to effectively implement the rule.

The sediment quality standards and the MCUL and SIZmax, as defined by a 10 year time of compliance and the chemical and biological criteria identified in Alternative 2, establish a range of environmental impacts that will be used to define a site-specific cleanup standard, and that will be allowed to exist in a SIZ. In all site cleanup actions and SIZ authorizations, the sediment quality standards will define the sediment quality goal. All site-specific cleanup standards will be set as close to the sediment quality standards as possible, and will not be allowed to exceed the MCUL, based on a consideration of environmental effects, cost, and engineering feasibility. Similarly, in all authorized SIZs, the maximum allowable contamination level will be set as close to the sediment quality standards as possible, not to exceed the SIZmax, after the implementation of AKART or BMP, as appropriate. When technically and economically feasible, Ecology will set site-specific cleanup levels at the sediment quality values. When impacted sediments are determined not to exceed the sediment quality standards following the implementation of AKART or BMP, a SIZ will not be necessary. In each of these scenarios, the goal the sediment quality standards (Alternative 1) will be achieved. As such, Ecology believes in some cases it will be possible to meet the sediment quality standards in the short term.

Ecology further anticipates that the sediment quality standards will be met in Puget Sound over the long term. For a discussion on the sediment quality standards (Alternative 1) as the long term goal for sediment quality in Puget Sound, please see the Introduction of the EIS.

#### Comment

D-6. "Concerning the location maps for sediment impact zones, it is suggested that a more detailed study of Bellingham Bay be conducted. Whatcom Creek effluents and outlet pipes from Georgia-Pacific are major sources of pollutants and sediment into the Bay. It is further suggested that these locales receive consideration as sampling areas."

#### Response

The EIS addresses the environmental impacts associated with the

implementation of the CSL, MCUL and SIZmax in the SMS rule for Puget Sound as a whole. As such, it has not been possible, and is beyond the intent of a programmatic EIS, to provide detailed information on all bay areas of the Sound. However, Ecology recognizes that more detailed investigations will be conducted on a site specific basis. Some areas of sediments impacted by Georgia Pacific discharges have been sampled. This information, as well as any available and necessary new sampling information, will be used to determine whether these discharges will require SIZs, once the implementation of AKART is confirmed. In addition, Ecology will incorporate any new information on sediments impacted by Georgia Pacific discharges as well as the results of any new samples from other areas of Bellingham Bay (e.g., Whatcom Creek effluent sediment samples) into cleanup decisions for already identified, or newly identified contaminated sediment sites.

**Nancy McKay**

Comment

D-7. "The Authority supports the alternative selected for determining the cleanup screening level, minimum cleanup level and sediment impact zone maximum chemical criteria. The criteria, in common with PSDDA site condition II, will greatly simplify the implementation of sediment cleanup. This should accelerate cleanup actions, thus limiting harm to biological resources. Also, the other, less stringent alternative would have been less protective of Puget Sound."

Response

Ecology acknowledges the Authority's support of the selected alternative.

Comment

D-8. "The Authority supports the use of the method that best predicts biological effects (eg., Apparent Effects Threshold, Equilibrium Partitioning) when setting the individual chemical criteria for sediments."

Response

Ecology acknowledges the Authority's support of chemical criteria that reliably predict biological effects.

**Dr. David H. Monroe**

Comment

**D-9.** "As stated in the DEIS, 'the standards identify a long-term goal for the quality of sediment in Puget Sound (sediment quality standards)'. The importance of these standards to the ecosystem of Puget Sound and the health of the human population dependent on that ecosystem cannot be overstated."

Response

Ecology acknowledges the comment and notes that by defining a "no adverse effects" long term sediment quality goal, the Sediment Quality Standards will protect the Puget Sound ecosystem and the health of human populations dependent on that ecosystem.

Comment

**D-10.** "This DEIS inadequately addressed the potential adverse environmental and human health impacts of the Sediment Management Standards. The general lack of detailed impact assessment precludes the identification of unreasonable adverse impacts. It also prevents a complete evaluation of the acceptability of impacts from and merits of the various Alternatives."

Response

The sediment quality standards and the alternatives evaluated in the draft EIS are based on the adverse biological responses of selected organisms exposed to contaminated sediments. By intent and definition, the preferred alternative would allow only minor impacts to biological resources, and the sediment quality standards would provide for no adverse effects to biological resources over the long term.

Ecology does acknowledge that because of the scientific method used, the sediment quality standards and the alternatives evaluated in the EIS cannot be directly expressed in terms of specific extent and magnitude of adverse impacts to the environment or human health. However, the chemical criteria do serve as hazard assessment indicators, and the biological species tested act as surrogates for the desired level of protection. Thus, while it is not possible to identify the actual impacts associated with each of these alternatives on a Sound-wide basis in the EIS, the impacts that may be expected from the alternatives can be compared relative to one another.

Ecology believes that risk assessment may be the best approach to determining the impacts to human health as a result of sediment contamination. The rule thus specifically allows for human health

impacts to be evaluated on a case-by-case basis until such time as state wide (or, e.g., Puget Sound wide) human health criteria are established. In this manner, unreasonable adverse impacts to human health will be avoided. Ecology plans to begin work on developing the human health criteria in cooperation with the Washington State Department of Health in 1991.

Several discussions in the draft EIS may have led the reader to conclude that adverse effects to the environment and to human health could be directly determined from the contaminant levels associated with the sediment quality standards and the alternatives being evaluated. As discussed above, this is not accurate. Ecology will make this distinction clear in the final EIS.

#### Comment

**D-11.** "The entire DEIS is based on an unfounded premise. The major premise of the Sediment Management Standards is that 'these standards represent a 'no effects' level in the environment' (page 1-6, DEIS). Alternative 1 is defined as having a 'no acute or chronic adverse effects on biological resources and no significant human health risk' (page 2-13, DEIS). The Department of Ecology has failed to support this premise throughout the development of the Standards.... The basis of the Standards, the Apparent Effects Threshold Approach (AET), is incapable of taking into account the impacts of bioaccumulation on an ecosystem. It also does not consider the risks to human health posed by the contamination of seafoods.... Ecology has also failed to develop Marine Sediment Quality Standards for chlorinated dibenzodioxins and chlorinated dibenzofurans which are major chemical of concern in the Pacific Northwest."

#### Response

The definition of Alternative 1 has been changed in response to this and other similar comments. The reference to Alternative 1 having no acute or chronic adverse effects on human health has been deleted. The numerical Sediment Quality Standards associated with Alternative 1 have been established to be protective against acute and chronic effects on biological resources. An equivalent set of numerical sediment quality criteria designed to be protective of human health have yet to be developed. Until such criteria are developed, the department will determine on a case-by-case basis the criteria, methods, and procedures necessary to protect human health (see WAC 173-204-320(4)).

It is recognized that the method used to develop the Sediment Quality Standards (i.e., the AET approach) does not explicitly take into account the direct or indirect impacts of

bioaccumulation on an ecosystem. Unfortunately, the present state of knowledge does not permit one to predict, with any reasonable degree of certainty, the body burden of chemical contaminants in resident organisms that will result from exposure to a given level of sediment contamination. While there are theoretical approaches to such an analysis, it is commonly accepted that there are too many poorly understood variables to yield accurate predictions of such body burdens. In addition, although bioaccumulation of certain sediment contaminants in resident organisms is known to occur, the level of bioaccumulation that results in an unacceptable adverse effect to the organisms is unknown. For some sediment contaminants (i.e., non-carcinogens), low levels of bioaccumulation may be tolerated with no adverse effects. For other sediment contaminants (i.e., known carcinogens), an increased exposure results in an incremental increase in risk, but the level of exposure that would result in an unacceptable level of risk to that organism is unknown.

For similar reasons, the present state of knowledge does not permit one to predict, with any reasonable degree of certainty, the risk to humans from ingestion of seafood harvested in areas with a given level of sediment contamination. With a given tissue concentration of a certain contaminant and reasonable assumptions about the exposure scenario, it is possible to estimate the risk to humans regularly ingesting seafood with that level of contamination. However, as indicated above, the limiting step in such an analysis is our inability to predict accurately the level of tissue contamination that will result from a given level of sediment contamination.

The data base presently available on chlorinated dibenzodioxins and chlorinated dibenzofurans is not sufficiently large to permit development of sediment quality standards for these compounds in Puget Sound. Until substantially more data become available, the department will determine on a case-by-case basis, the criteria, methods, and procedures necessary to protect against acute and chronic adverse effects of these contaminants (see WAC 173-204-320(5)).

The rule establishes the "no effects" goal as a narrative criterion and goal for the quality of all sediments. As new scientific information becomes available, the criteria contained in the rule will be updated.

#### Comment

Appropriate Considerations in the Final EIS

**D-12.** "An in-depth discussion of the qualitative and quantitative relationships between sediment contamination and bioaccumulation



of chemical contaminants in the food chain."

Response

The EIS has been modified to better address the ecological effects of bioaccumulation. An in-depth discussion of the qualitative and quantitative relationships between sediment contamination and bioaccumulation of contaminants in the food chain is beyond the scope of a programmatic EIS. Human health effects will be addressed in a supplemental EIS.

Comment

**D-13.** "A 'worst-case analysis' of the impacts of contamination of the entire Puget Sound to the level of the so-called 'no effects' level, 'long-term goal for the quality of sediment in Puget Sound' (the Marine Sediment Quality Standards), which includes:

- a) An ecological risk assessment for bioaccumulation of sediment-derived chemical contaminants in the food chain, with particular assessment of potential adverse impacts on marine mammals and fish-eating bird species.
- b) A human health risk assessment for consumption of contaminated seafoods at levels of contamination in crab, fish, and shellfish determined in a) above.
- c) An assessment of the costs of cleanup in this worst-case scenario if new data, twenty years from now, indicate that the Sediment Quality Standards greatly underestimated the ecological and human health impacts of chemical contamination of sediments."

Response

The Environmental Impact Statement is intended to delineate the actual expected impacts of the proposed rule. The scope of the EIS does not include consideration of all possible alternative impacts—neither "worst-case" nor "best-case". An ecological risk assessment for Sound-wide contamination to the cleanup level is therefore beyond the scope of the EIS. Human health risks will be addressed in a supplemental EIS.

Ecology determined that risk assessment would not be the best approach to developing sediment quality criteria that are protective of biological resources because the relationship between the concentration of contaminants in the sediments and concentrations in fish and shellfish is not yet adequately understood. In addition, site specific ecological risk assessments require intensive efforts that are often beyond

project capabilities and time frames. For these reasons, Ecology is committed to the use of scientifically-based sediment criteria as discussed in the EIS, and as set forth in the rule.

Comment

**D-14.** "An assessment of the feasibility and effectiveness of mitigations for contaminated seafoods, including an evaluation of current mitigations against harvesting in contaminated embayments (such as crabbing in Bellingham Bay and Everett Harbor), and an assessment of the adequacy of current and future monitoring of seafood contamination (such as dioxins and mercury in Dungeness crab of Everett Harbor and Bellingham Bay, respectively)."

Response

Ecology recognizes the importance of determining the extent of contamination to harvestable seafood resulting from exposure to contaminated sediments, as well as the importance of mitigating the effects of this impact. However, these determinations are beyond the scope of this programmatic EIS. The appropriate response to these issues may vary significantly from one location to another and will of necessity be addressed on a site-specific basis.

Comment

**D-15.** "An assessment of need and plan for additional research to verify the adequacy of Sediment Quality Standards, including such studies as spiked sediment bioassays, mesocosm studies of bioaccumulation, ecological studies of the relationships between sediment contamination and bioaccumulation. Current data gaps and uncertainties related to the Sediment Management Standards should be discussed."

Response

The derivation of the sediment quality standards is not addressed in this EIS. A Declaration of Nonsignificance was prepared for the adoption of these "no effects" standards. Of course, it is Ecology's goal to ensure that all of the provisions of the SMS rule accurately reflect the latest available scientific information as determined through ongoing validation and refinement. This policy is specifically included in the SMS rule under Section 173-204-130, Administrative policies.

Regarding the existence of data gaps and uncertainties related to the implementation of the SMS, Ecology acknowledges that the standards are based on an evolving data set, and that new data and scientific information will necessitate periodic review and

modifications of the rule's requirements. Section 130 of the SMS rule where identifies Ecology's intent to review the rule on an annual basis, and to modify the rule every three years, or as necessary. A statement acknowledging that periodic review and modification of some rule requirements may be necessary has been added in Chapter 2 of the final EIS.

Comment

**D-16.** "Mitigation plans for all identified unreasonable adverse impacts."

Response

This programmatic EIS is not intended to identify all adverse impacts that would actually result under the alternatives. Rather, the purpose of the EIS is to evaluate the alternatives in terms of the types of environmental impacts that would be expected to result from their use as sediment contamination criteria, and from their incorporation into source control and cleanup procedures throughout Puget Sound. However, Ecology does acknowledge the importance of identifying unavoidable adverse impacts and mechanisms to minimize or mitigate them. A summary of unavoidable adverse impacts has been included in Chapter 5 of the final EIS. In addition, Ecology anticipates that site-specific EISs will also include such discussions. Section 560 of the rule will be modified to clarify that unavoidable adverse impact issues shall be identified and considered on a case-by-case basis.

Comment

**D-17.** "Assessment of potential impacts to rare, threatened, and endangered species."

Response

Additional discussion of potential impacts to rare, threatened, and endangered species has been added to the chapter discussing the affected environment. Additionally, specific impacts to these species will be discussed in detail in site-specific EISs.

Comment

Additional Alternatives for Consideration in Final EIS

**D-18.** "Non-Degradation Standard/SQS Approach: This alternative would require that pristine areas of Puget Sound be protected from chemical contamination. Currently contaminated areas would be managed as specified under Alternative 1 or 2 in the Draft EIS. A non-degradation standard has the benefit of avoiding future

expensive cleanup costs which become necessary as previously unidentified unreasonable adverse impacts are recognized. It would also prevent chemical contamination of areas critical for wildlife habitat and commercial and recreational fish and shellfish harvesting. Protection of these areas would greatly reduce ecological and human health impacts from the bioaccumulation of toxic and carcinogenic chemicals."

#### Response

The antidegradation policy set forth in Section 120 of the SMS provides for the protection of "pristine" areas that are less contaminated than the applicable sediment quality standards, and for the protection of existing beneficial uses. Ecology will clarify this policy in the discussion of the sediment management process set forth in chapter 2 of the EIS.

#### Comment

**D-19.** "Combined AET/Risk Assessment Standard: This alternative would set chemical specific sediment quality standards using a combination of the AET Approach, laboratory aquatic toxicity studies including mesocosm studies of chronic effects and bioaccumulation, ecological studies relating sediment contamination and bioaccumulation in the food chain, ecological risk assessment, and human health risk assessment regarding the consumption of contaminated seafoods."

#### Response

The alternatives evaluated in the EIS were selected by Ecology using accepted available methods and the recommendations made by the SMS Workgroup (Workgroup). The SMS Workgroup consisted of a balanced number of individuals representing both environmental protection and economic development concerns. Alternatives including several of the ones listed in the comment were specifically considered.

While some of the recommended approaches (e.g., mesocosm studies of chronic effects and bioaccumulation, ecological studies relating sediment contamination and bioaccumulation in the food chain, ecological risk assessment) show promise, they have undergone insufficient research and development in Puget Sound to be used in a regulatory program. Ecology will consider the use of such approaches in any future revisions to the SMS, should further research and development establish these as acceptable procedures.

Please see Ecology's response to comment B-71.

Human health criteria sections of the rule are currently

`reserved.' Human health risks will thus be considered on a case-by-case basis until such time as definitive human health criteria are developed. Ecology anticipates that some form of human health risk assessment will be used both in site-specific evaluations, and in the future development of definitive human health sediment criteria. Ecology plans to begin work on developing human health criteria in cooperation with the Washington Department of Health in 1991.

#### Comment

**D-20.** "No Action Alternative: This alternative would use existing regulations (MTCA, QWA [sic] etc.) or modifications thereof to prevent discharges having adverse impacts on the ecosystem and human health in the Puget Sound region, and to guide cleanup of contaminated sediment sites. State of the art ecological and human health risk assessment would be a major guiding force in this approach."

#### Response

The sediment quality standards have received a determination of non-significance (DNS) and are therefore not under evaluation in this EIS. As such, if a sediment impact zone contamination level or cleanup level higher than the sediment quality standards is not developed, the "no action" alternative would require that all sediments meet the sediment quality standards values. This "no action" alternative (Alternative 1) has been evaluated in the EIS.

Human health criteria sections of the rule are currently `reserved.' Human health risks will thus be considered on a case-by-case basis until such time as definitive human health criteria are developed. Ecology anticipates that some form of human health risk assessment will be used both in site-specific evaluations, and in the future development of definitive human health sediment criteria. Ecology plans to begin work on developing human health criteria in cooperation with the Washington Department of Health in 1991.

Relative to ecological risks, Ecology determined that quantitative ecological risk assessment would not be the best approach to developing sediment quality criteria that are protective of biological resources because the relationship between the concentration of contaminants in the sediments and concentrations in fish and shellfish is not yet adequately understood. In addition, site-specific ecological risk assessments require intensive efforts that are often beyond project capabilities and time frames. For these reasons, Ecology is committed to the use of scientifically-based sediment criteria as discussed in the EIS, and as set forth in the rule.

**G. Patrick Romberg**

Comment

**D-21.** "The DEIS and Economic Analysis both show that the cost of implementing these standards will be high due to costs associated with monitoring and cleanup activities. However, the regulations provide no clear quantification of the true benefit either to the marine ecosystem or to human health. The DEIS simply indicated that there will be less risk at lower concentrations and greater risk at higher concentrations, which is too general for the large amount of resources involved."

Response

The potential benefits to the marine ecosystem are clear under each alternative: no adverse impacts for Alternative 1, minor adverse impacts for Alternative 2, and severe impacts for Alternatives 3 and 4. The scope of these impacts is quantified in the EIS. The scope of impacts is based upon the current distribution of sediments within Puget Sound that exceed the criteria relative to these different alternatives. Environmental and human health benefits cannot be quantified in the same terms as economic costs (i.e., dollars), and a cost-benefit analysis is not required for an EIS (WAC 197-11-450).

Comment

**D-22.** "Discussions in the DEIS regarding cost effectiveness of the various cleanup options are over simplified. Without knowing what the real risk is to the marine environment or human health, it is not possible to conduct a meaningful assessment of cost effectiveness."

Response

Detailed assessments of cost effectiveness cannot be made in a programmatic EIS, because site-specific effects, particularly the cleanup action selected, will have an overriding impact on costs. The EIS does quantify relative costs of the alternatives, other things being equal. The comment implies that environmental and human health risks should be considered in a determination of cost effectiveness, but the evaluation of cost effectiveness is not intended to be a risk-benefit analysis. The evaluation of cost effectiveness is intended to provide a semi-quantitative assessment of the relative costs of the different alternatives.

**W. Arthur Noble**

Comment

**D-23.** "We find the proposed rules and the draft EIS supporting them to be inadequate for their lack of scientific and technical justification in terms of public health risk assessment, their failure to designate sediments that have chronic adverse affects on biological resources and their failure to address bioaccumulation and related long-term impacts such as those on human consumption and those on fish or shell fisheries and aquatic birds. "We believe that the proposed standards constitute a significant threat to public health, and we urge the Department of Ecology to reform the proposed standards and the EIS supporting them."

Response

Please see Ecology's response to comments D-10 and D-19.

Comment

**D-24.** "Although the Department of Ecology has named chlorinated dioxins and furans and 'chemicals of particular concern,' the EIS fails to provide for, or even mention the need for, testing for them, particularly in areas adjacent to bleaching pulp and paper mills (see Draft EIS, p. 5-7)."

Response

Sediment management standard values have not yet been established for several chemicals of concern due to a lack of data at the present time. The SMS recognize that it will be necessary to consider such chemicals and other deleterious substances on a case-by-case basis until such time as definitive values are established. Ecology anticipates that the SMS will be modified to include these values as they become available. Ecology will add a statement to this effect to the final EIS.

**Morton Blomso and Doug Brickley**

Comment

**D-25.** "First, we agree with the concept of improving sediment quality through source control and cleanup, and, therefore,

support your efforts."

Response

Ecology acknowledges this comment.

Comment

**D-26.** "Second, we believe that special consideration should be given to the culture of finfish in net-pens. Although sediment accumulation can occur which may effect the loss of certain benthic species, the nature of the discharge and its temporary impact justify special consideration."

Response

Some net pen operations in Puget Sound may result in sediment accumulation with an associated loss of impacted benthic species.

As such, net pen operators may be required to apply for sediment impact zones as required by the SMS. However, Ecology does recognize the relatively unique discharge characteristics associated with net pen operations. Thus, the SMS provide for flexibility in establishing sediment impact zone compliance requirements for all discharge types and facility conditions, including net pen operations.

**Richard Ford**

Comment

**D-27.** "Ecology should also test certain assumptions made in the DEIS in support of the rule in deciding on maximum sediment contamination levels in the final rule."

Response

The approach used to define maximum sediment contamination levels identified in the rule reflect over two years of discussion between Ecology, other interested agencies, tribes, cities, industry, environmental groups, and legal/technical consultants. The SMS Workgroup recommended that biological effects should be consistently used to describe the alternatives for the CSL, MCUL, and SIZmax alternatives. Ecology agrees with this recommendation and conducted a technical study to test the alternatives mentioned by the workgroup.

The alternatives evaluated in the EIS are in keeping with this agreed approach. The maximum sediment contamination levels identified in the rule are based on the evaluations conducted in



the EIS. Ecology believes that the underlying assumptions used in the EIS in evaluating the alternatives are appropriate and in compliance with the consensus reached by all of those involved in the process of developing the SMS.

#### Comment

**D-28.** "The DEIS fails to fully consider and compare the regulatory alternatives available to Ecology. "The DEIS sets as its purpose the evaluation of four alternatives for determining the maximum degree of sediment contamination to be allowed during the implementation of sediment management activities.... "As we indicated...the purpose of the DEIS is misplaced. The EIS should describe Ecology's programmatic sediment management proposal in terms of the general objective of applying the sediment quality standards to Ecology's multiple discharge control and contaminated sediment cleanup programs, and should include consideration of not applying the sediment quality standards...(to) encourage the full consideration and comparison of regulatory alternatives which include not promulgating the proposed rule. "... Furthermore, neither Ecology nor the Authority indicated in their EISs that they were using phased review, as is required under the State Environmental Policy Act. "Therefore, we urge Ecology in its final EIS on the proposed rule to fully consider and compare the environmental and economic impacts associated with all regulatory alternatives available to it, including not promulgating the proposed rule. If the final EIS indicates that the environmental benefits of sediment management can be realized through existing regulatory programs or are outweighed by economic costs, we believe that Ecology should reconsider promulgation of the proposed final rule."

#### Response

The EIS is not out of compliance with SEPA based on the lack of an explicit phased review. In accordance with SEPA 197-11-340 WAC, Ecology has filed a determination of nonsignificance for the sediment quality standards based on the fact that the standards represent "no adverse effects". Thus, discussion of a phased review is unnecessary.

During development of the rule, Ecology did compare all regulatory alternatives available, including not promulgating the rule. The final alternatives evaluated in the EIS were selected by Ecology in consultation with, and represent a consensus reached by, other interested agencies, tribes, cities, industry, environmental groups, and legal/technical consultants (See response to comment D-27). Chapter 2 of the EIS discusses several other potential alternatives that were dropped from consideration, and includes the reasons for eliminating them. The primary reason for

promulgating the SMS rule is to reduce the environmental and economic uncertainty associated with managing contaminated sediments on a case-by-case basis with no consistent guidelines applicable to similar situations.

The programmatic sediment management proposal is adequately discussed in the draft EIS. In particular, the introduction to the EIS includes a discussion of the objective of the proposal. With regard to the comment that Ecology should consider not applying the sediment quality standards as one alternative, please see Ecology's response to comment D-20.

#### Comment

**D-29.** "The proposed final rule does not allow enough flexibility in setting maximum sediment contamination levels. "Not setting a minimum cleanup level is appropriate for several reasons. First, there is no evidence in the DEIS that increasing levels of sediment contamination will result in increased cumulative adverse biological and human health impacts.... Second, individual cleanups are site-specific and involve significant costs.... Third, the DEIS fails to explore the practicality and environmental impacts of the proposed cleanup levels.... Finally, cleanup activities would result in significant biological and human health risks, including habitat destruction, removal or burial of benthic organisms, worker exposure to contaminants and transportation-related injuries and fatalities.... Each of these reasons suggest that Ecology needs ample flexibility in determining what cleanup standard may be appropriate for an individual cleanup site. Therefore, Ecology should consider that no minimum cleanup level option in the final rule and in its evaluation of alternatives in the final EIS. "...If any minimum cleanup level is chosen, it should be no lower than the highest AET.... Setting a minimum cleanup level also has far greater economic costs than determining other maximum contaminant levels.

Setting a minimum cleanup level at a level less conservative than that used in source control and dredging activities would be equally protective of human health and the environment because it would allow case-by-case consideration of the significant adverse environmental impacts associated with cleanup activities. Therefore, if Ecology chooses any numeric minimum cleanup level, it should be no lower than the highest AET."

#### Response

In March, 1990, the SMS Workgroup (Workgroup) was created to assist Ecology in formulating a workable SMS Rule. The members of the Workgroup were selected with the specific intent of assuring a balanced representation of environmental protection and economic development concerns. The Workgroup reached a consensus recommendation that maximum contamination levels should be stipu-

lated in the rule. Ecology concurs with this recommendation.

Ecology recognizes that flexibility is necessary in order to effectively implement the rule. The rule thus allows for the consideration of multiple factors, including the potential for natural recovery, cost, and engineering feasibility, in setting the maximum allowable sediment contamination level to be allowed in source control and site cleanup activities. On the other hand, Ecology believes that the SMS must also ensure an acceptable level of environmental and human health protection. The maximum sediment contamination levels, as well as the provisions in the rule for considering protection of human health (i.e., human health shall be considered on a site specific basis until definitive criteria are developed), will ensure that this goal is met. In addition, by defining maximum allowable contamination levels, the economic and environmental uncertainties associated with making this determination on a case-by-case basis will be minimized. For these reasons, Ecology will not consider the no minimum contamination level (for source control or cleanup) in the final rule, or in the final EIS. However, Ecology does recognize that new scientific information may support modifications to the rule in the future, and specifically recognizes this in Section 130 of the SMS.

Ecology does not believe that if a minimum cleanup level is defined, it should be set at the highest AET. The minimum cleanup level proposed in the rule is supported by the evaluation conducted in the EIS.

#### Comment

**D-30.** "We agree with Ecology that an external advisory group, which would include a balanced representation from environmental protection and economic development interests, should be set up for consistent implementation oversight.... This group can address requirements for implementation activities not specified within the Sediment Management Standards rule, such as the issue of allocating loads between multiple dischargers, and review rule guidance documents prepared by Ecology."

#### Response

Ecology acknowledges this comment and agrees that the activities of an external advisory group will provide valuable assistance in ensuring the successful implementation of the SMS rule.

#### Comment

**D-31.** "The DEIS is a well-written document that is easy to understand. It is useful for understanding the rule, its technical methods (such as the AET approach), and its environmental impacts."

Response

Ecology acknowledges this comment.

Comment

**D-32.** "The final EIS should include a discussion of a sediment impact zone case study involving load allocation between multiple sources.... This case study is necessary to understand how sediment impact zones will perform when applied to more complex situations."

Response

A case study involving load allocation between multiple sources has not been included in the final EIS. Such a case study is not presently available, and to conduct one at this time would be beyond the resources available to the department for completing the EIS. Such a case study is not required by SEPA and would go well beyond the programmatic scope of the EIS.

Comment

**D-33.** "The DEIS assumes, by definition, that increasing levels of sediment contamination will result in increased cumulative adverse biological and human health impacts. ... It does not provide any empirical evidence to back up this assumption. ...we believe that it is critical that the final EIS nail down these risks if any conclusions are to be made about the relative environmental protectiveness of the different alternatives."

Response

The four alternatives considered in the EIS are defined in terms of increasing biological effects, not in terms of chemical concentrations. Chemical concentrations that are associated with these increasing levels of biological effects have been determined for Puget Sound through an empirical, biological effects-based approach, the AET approach. As can be seen from Table 2.1, the concentrations associated with increasing biological effects also increase accordingly.

Regarding human health, most toxicologists agree that there is no safe level of exposure to carcinogenic contaminants, and that the risk of developing cancer from exposure to these contaminants

increases as the dose increases. Therefore, it is reasonable to assume that exposure to increasing concentrations of carcinogens in sediments increases the risk to human health. However, at present there is not a standardized risk assessment procedure for determining the magnitude of the risk to human health from specific concentrations of contaminants in sediments. Recognizing this, Ecology has chosen to reserve the portion of the rule providing human health-based sediment management standards until a methodology is developed for relating human health risks to sediment concentrations.

Comment

**D-34.** "The DEIS states that, except for the costs of attaining AKART, corresponding costs for establishing and maintaining a sediment impact zone are expected to be similar under the different alternatives.... Ecology will require higher (and more costly) monitoring for discharges that are more likely to exceed the sediment impact zone maximum criteria.... Ecology will require higher (and more costly) monitoring where the maximum sediment impact zone maximum criteria become more stringent."

Response

The DEIS incorrectly implied that, in general, more monitoring would be required where maximum sediment impact zone criteria become more stringent. This inference has been deleted in the final EIS. The costs for establishing and maintaining a sediment impact zone are expected to be similar under the different alternatives because a similar range of monitoring costs is expected to apply to each alternative. The economic impact statement presents an analysis for three different levels of monitoring that may be applied depending upon site-specific characteristics, including whether a discharge may be more likely to exceed the maximum criteria for these zones.

Comment

**D-35.** "The DEIS does not address the programmatic impacts of different alternatives on Ecology's ability to implement the rule in a consistent and timely fashion.... These impacts should be addressed in the final EIS. The discussion should include a consideration of staffing requirements under the different alternatives and of the effect of phasing in compliance with the Sediment Management Standards. It should address any relevant comments made in the forthcoming report of the Governor's Efficiency Committee on Ecology's Washington Discharge Permit Program."

Response

Ecology does not believe that the subject of this comment needs further elaboration in the final EIS. The impacts of staffing will be largely independent of which alternative is selected, being more dependent on available funds and competing programs. The effects of phasing compliance are indirectly addressed in the EIS. That is, greater source control follow-up and cleanup activity will be required under the more stringent alternatives than under the less stringent activities. It is thus reasonable to assume that it will take longer for the department to assure compliance as the alternatives become more stringent.

Regarding the Efficiency Commission's findings, please see Ecology's response to comment B-117.

#### Comment

**D-36.** "The DEIS chapter on evaluation of alternatives is not useful in its present form as a method for selecting a preferred alternative. First, it is built upon several unsupported assumptions, including that the human health risk associated with exposure to residual contamination will be greater than the risk associated with cleanup activities (DEIS at 6-2) and that increasing levels of sediment contamination will result in increased cumulative adverse biological and human health impacts (DEIS 6-2 and 6-4). We recommend that Ecology reconsider the use of these assumptions in its final EIS, and if it still believes that these assumptions are appropriate, that it provide a justification for their use. Second, the discussion on compliance with "all applicable or relevant and appropriate requirements" ("ARARs") is meaningless.... Thus, we recommend removing this criterion from the threshold criteria. Finally, the evaluation of alternatives does not consider whether one alternative is better suited to establishing one maximum allowable sediment contamination level and another alternative is better suited to establishing another maximum sediment contamination level. (See DEIS at 6-15 to 6-17.) We ask that Ecology more fully address in the final EIS arguments why different alternatives should be used for different maximum sediment contamination levels, such as that provided above in Section B of this letter."

#### Response

Human health risks associated with cleanup activities are well-characterized and are always addressed in a site-specific health and safety plan. Personnel involved in cleanup actions are trained to handle hazardous substances in accordance with state and federal law; specific safety procedures and equipment are used to minimize the risks from hazardous activities. Cleanup personnel are in contact with the site for a relatively short time

and are subjected to continuous medical monitoring to ensure that unacceptable exposure does not occur.

In contrast, the public may be exposed to residual contaminants at a site over a lifetime, and are not provided with any training or monitoring to ensure their safety. Activities at the site, once cleaned up, are generally not restricted, and may include recreational activities that would result in physical contact with and ingestion of sediments. In addition, children and other sensitive members of the population may be exposed. Therefore, Ecology believes that residual contamination poses a higher potential for risks to human health, if left at an unacceptable level, than does the cleanup process.

See the response to comment D-33 for a discussion of increased cumulative biological and human health impacts with increased concentration.

Compliance with ARARs is an important criterion for evaluation of the alternatives, because it is a requirement of the Model Toxic Control Act (which provides partial authority for the development of cleanup standards) that cleanup standards be at least as stringent as all federal and state laws, including Section 121 of CERCLA/SARA. Section 121 includes all applicable or relevant and appropriate requirements. Therefore, these requirements must be considered during the development of cleanup standards. Although there are no state or federal laws that are directly applicable, Superfund guidance recognizes that certain guidelines and criteria may be appropriate to consider in an ARAR analysis. Ecology believes it is appropriate to consider PSDDA guidelines in development of the sediment management standards.

Establishment of  $SIZ_{max}$ , CSL, and MCUL at different levels was considered during the early stages of rule development. As a result of this evaluation, Ecology concluded that it was important to maintain consistency among the various portions of the rule. These arguments are developed more fully in the section titled "Relation between  $SIZ_{max}$ , CSL, and MCUL" in Chapter 2 of the EIS; because this alternative was eliminated as part of the scoping process for rule development, such an alternative was not considered in this EIS and is not evaluated in Chapter 6.

#### Comment

**D-37.** "The DEIS states that Ecology included 'all majority views' of the Sediment Management Standards Work Group in the proposed rule. DEIS at 8-2. This is not quite accurate. Ecology included the views of the Sediment Management Standards Work Group where consensus could be reached. The final EIS should be corrected accordingly."

Response

Ecology has made the appropriate correction to the EIS.

**Eric Johnson**

Comment

**D-38.** "Specifically, it should be stated for the record that the derivation of most of the numbers in this analysis is unclear. A lot of supporting technical documentation is undoubtedly needed in order to follow the specifics of the AET methodology and its transformation into numeric sediment criteria. Consequently, most reviewers cannot provide a scientifically critical review of the document."

Response

References to the documents that were sources of the values representing SIZ(max), CSL, and MCUL alternatives have been provided in the EIS.

Comment

**D-39.** "In addition, few of the policy tradeoffs which are inherent in the selection of specific numerical criteria are clearly presented for comment. Table 6.1 provides the reader with a hint of the type of tradeoff analysis that must have gone into the sediment criteria decisions, but this analysis is difficult to find upfront."

Response

Please see Ecology's response to Mr. Ford's comment D-35 above. In addition, some modifications have been made throughout the EIS in an effort to more clearly address these tradeoffs.

Comment

**D-40.** "It should also be mentioned that the Sediment Policy Work Group which worked as an advisory body to the Department in the formulation of the sediment management rule did not have either the opportunity or the quantitative scientific background to work through the development of the criteria or the final choice among the alternatives. "Realizing this, it may be useful for the Department to reconvene interested members of the work group to explain how Ecology analytically arrived at the preferred alternative."



### Response

Ecology acknowledges that the SMS Workgroup was not constituted for the purpose of conducting technical review of the alternatives. Technical documents were distributed to the workgroup, made available to other interested parties, and are now referenced in the final EIS. Though a future technical meeting will likely occur, such a meeting has not been suggested or indicated by technical reviewers of the documents.

The development of the alternatives discussion presented in Chapter 2 has been expanded to include the alternatives that were dropped from consideration. Ecology's approach to evaluating the alternatives and choosing a preferred alternative is described in detail in Chapter 6, *Evaluation of the Alternatives*. Each criterion is described and the scores of all the alternatives under the criteria are presented. Finally, the rationale for choosing the preferred alternative, based on these scores, is presented.

### Comment

**D-41.** "It is the position of the Washington Public Ports Association that the preferred sediment criteria of the draft EIS are acceptable, provided that the non-dispersive guidelines of the Puget Sound Dredged Disposal Analysis (PSDDA) continue to define the range of 'clean' sediments with Puget Sound. This management decision allows sediments to be managed within Puget Sound in an efficient yet environmentally protective fashion."

### Response

The proposed SMS provide a definition of 'clean' sediments in Puget Sound. Ecology agrees with the "regulatory beauty" approach which would set the SIZ maximum contamination levels at the same degree of biological effects allowed at the PSDDA non-dispersive unconfined, open-water disposal sites. The alternative selected as a result of the evaluations in the EIS (Alternative 2) is consistent with this position. Ecology is committed to ensuring that the sediment management and PSDDA programs continue to complement one another over the long term.

### Comment

**D-42.** "As a final point, it is important that the final EIS clearly indicate that in the establishment of Sediment Impact Zones (SIZ's), there may be some irreversible and irretrievable

commitment of natural resources within the SIZ, even if the overall impact is one of 'minor effects'."

### Response

A section discussing unavoidable adverse impacts has been added to chapter 5 in the final EIS. Ecology acknowledges that such impacts may, during the life of a sediment impact zone, represent an irreversible and irretrievable commitment of some natural resources. However, as noted in chapter 2 of the EIS, closure of a sediment impact zone may require continued monitoring or active cleanup as appropriate to ensure recovery of impacted sediments to the levels allowed in the sediment quality standards. In addition, the sediment impact zone maximum allowable contamination level will in all cases be set at the lowest level possible following AKART or BMP, as determined by modeling and the department's best professional judgement. Thus, sediment impact zones may not result in an indefinite irreversible and irretrievable commitment of natural resources.

**George Ploudre**

### Comment

#### **D-43. "Native American Cultural Resources**

1. The treatment of cultural resources on pages 3-9, 5-14, and 5-26 covers Native American cultural concerns well, but fails to consider archeological and historical sites, especially state and federal responsibilities to identify, evaluate, and preserve such sites. The component of cultural resources management is missing and should be included in the document.
2. In particular, two categories of historic properties need to be specifically considered in the sediment management standards: historically significant sunken vessels and sunken aircraft.
3. Recommend that authors consult RCW 27.53 to determine how provisions of the Washington State Archeological Sites and Resources Act pertain to sunken historic properties, including aircraft.
4. Also suggest that the writers consult the U.S. Department of the Interior's Abandoned Shipwreck

Guidelines published in 54 Federal Register 13642-658 (4 April 1989). Certain provisions which relate to transfer of title of sunken historic properties to the respective states for management and protection seem especially pertinent."

#### Response

The discussion of cultural resources has been modified in the final EIS to address these concerns. RCW 27.53 and 54 Federal Register 13642-658 (4 April 1989) have also been identified as laws and regulations that will need to be considered as appropriate on a case-by-case basis in the discussion of laws and regulations that may affect implementation of the Sediment Management Standards.

#### Comment

**D-44.** "Reference: Introduction - Page 1-7 - last paragraph

The preferred alternative of the State is functionally equivalent to the PSDDA programs Site Condition II. What does this do to disposal sites only accepting Condition I material? The PSDDA site conditions are set at two levels."

#### Response

Setting the selected alternative at the level which is functionally equivalent to the less stringent PSDDA site condition will help to assure that the two programs can be implemented without conflict. Any contaminated sediments that do not meet the more stringent conditions to be disposed of in PSDDA sites accepting only "Site Condition I material" would simply have to be disposed of in some other acceptable location, or in some other acceptable manner.

Given the similarity between the proposed sediment quality standards and the PSDDA "Site Condition I" guidelines, sites using the latter guidelines may not require a sediment impact zone authorization.

#### Comment

**D-45.** "The DEIS does not make clear as to the impact to navigation dredging from establishing S.M.S. How cleanup is associated with the required navigation dredging activities is not addressed nor are impacts acknowledged. They should be."

Response

Navigation dredging may be associated with the cleanup of contaminated sediments to the extent that areas identified for cleanup overlap with areas requiring dredging. The rule does not substantively alter dredging or disposal practices conducted for navigation purposes. The impacts associated with areas identified for cleanup (contaminated sediment sites) are discussed in the EIS.

Comment

**D-46.** "Reference: Page 2-13

Please see the final PSDDA Phase II MPR page 28 for the full definition of non-dispersive disposal guideline. Statement here is not complete."

Response

Comment noted, the full definition of the PSDDA nondispersive disposal guideline will be incorporated into the EIS.

## E. WRITTEN COMMENTS ON THE ECONOMIC IMPACT STATEMENT

**Dr. David Jamison**

### Comment

**E-1.** "You should make more of a point that state agencies will have to turn to the General Fund or the Toxics Account to pay for their portion of cleanup and natural resource damages. Depending on which fund, the general public may be directly effected (sic) financially."

### Response

Comment was noted in Part I, Section 3.2 of the final economic impact statement.

### Comment

**E-2.** "You should mention that SIZ and SRZ will likely have a lease from the state that is associated with a lease fee, assurances of compliance such as bonds and monitoring costs. These costs will be in addition to Ecology fees."

### Response

Comment was noted in Part I Section 3.2 of the final economic impact statement.

**Nancy McKay**

### Comment

**E-3.** "The Authority commends Ecology in addressing the economic impact of this rule and the mitigation of its costs."

### Response

Comment noted.

**John L. Pitts**

### Comment

**E-4.** "I support the concept you have proposed but have questions regarding the latitude which will be given to biological impacts and sediment impact zones. ... I believe special consideration

should be made for existing and future net-pen culture in fresh or marine waters.... "The Economic Impact Statement for proposed sediment management standards lists fish hatcheries and preserves as industries less likely to be affected by proposed sediment management rules (Table 1). I would like to suggest that net-pen facilities for fish culture and off-bottom facilities for shellfish culture, be placed in this same category."

Response

In the introductory text to Part I Section 2, it was noted that net-pen culture operations may soon come under the purview of NPDES permits and that they will probably not be significantly affected by the proposed rule because their discharges are not likely to contain toxic contaminants. Net-pen facilities and shellfish rafts are listed as examples of industries that would likely be included in SIC code 0921 in Part I Section 2. Net pen operations in Puget Sound will be eligible for sediment impact zones authorized through the SMS. Due to the unique discharge characteristics of net pen operations, Ecology's Water Quality Program has to date established specialized sediment monitoring requirements within discharge permits for these facilities. The flexibility for establishing individualized monitoring requirements for different discharger types and case-by-case facility conditions is already authorized within the proposed SMS.

**Christopher H. Gibson**

Comment

**E-5.** "I believe special consideration should be made for existing and future net-pen culture with regards to the loss of certain benthic species. The quality of the discharge and reversible nature of the impacts justifies this special consideration. "The Economic Impact Statement for Proposed Sediment Management Standards lists fish hatcheries and preserves as industries less likely to be affected by proposed sediment management rules. I suggest that net-pen facilities sited in accordance with the state siting guidelines be placed in this same category."

Response

Please see Ecology's response to comment E-4 above.

**Dan R. Van Slyke**

Comment

**E-6.** "Net-pen operations are sited by the State in areas of non-critical habitat and in most cases, the net-pen systems will provide habitat where none existed prior to the installations of the facilities.... "For these reasons, I feel that all aquaculture operations, including shellfish operations, should be given the same status of fish hatcheries and preserves that the EIS for the proposed standards lists as industries less likely to be affected by the proposed rules.... "All of these operations could be affected by the proposed standards unless they are given the status that these beneficial uses should."

Response

Please see Ecology's response to comment E-4 above.

**Morton Blomso and Doug Brickley**

Comment

**E-7.** "... we suggest that net-pen facilities for fish culture be placed in the same category as fish hatcheries and preserves which industries the...EIS cites as less likely to be affected by the proposed sediment management rules."

Response

Please see Ecology's response to comment E-4 above.

**G. Patrick Romberg**

Comment

**E-8.** "Monitoring costs for having an SIZ are unreasonably high. The DEIS states that it will cost between \$127,000 and \$252,000 in monitoring costs to have one SIZ over a 5 year permit cycle. Metro does not consider this level of monitoring to be insignificant as the DEIS concluded."

Response

The correct range of monitoring costs identified in the draft Economic Impact Statement is from \$27,100 to \$232,100. The draft Environmental Impact Statement incorrectly quoted these costs and has been corrected for the final document. The monitoring cost estimates assumed a relatively intensive monitoring effort. These estimates may exceed actual costs of programmatic requirements. The proposed rule does not specify the level of effort that will be required for monitoring. Specific monitoring requirements are

not included in the rule, to provide Ecology with the flexibility for tailoring monitoring requirements based on site-specific and discharge-specific conditions. As indicated in the economic impact statement, the term "insignificant" is premised on costs that are less than 1% of sales. The Economic Impact Statement identifies this premise.

Additionally, when considering the costs of monitoring, Ecology believes it is necessary to generally view these costs as "preventative" against much higher costs associated with contaminated sediment cleanup actions which may be required in cases where source discharge monitoring did not occur and impacts or potential impacts to environmental resources and human health resulted.

#### Comment

**E-9.** "Dischargers that need multiple sediment impact zones could be required to spend an unreasonable amount of money on monitoring costs. For example, if Metro needs an SIZ for each of the 13 marine CSOs, the projected monitoring costs could be approximately \$1,500,000.00 to \$3,300,000.00 over the next 5 years. Metro strongly objects to these potential high monitoring costs and believes it would be far better to spend these public funds on completing the CSO reduction projects."

#### Response

Comment noted. See response to comment E-8. Adjustments to monitoring requirements for dischargers needing multiple sediment impact zones are possible under the proposed rule. Data from one discharge may also be representative of other similar discharges.

#### Comment

**E-10.** "Ecology should consider ways of reducing the potential monitoring costs. One approach would be to reduce the frequency of monitoring to every other year or even two years. Sediment concentrations are not expected to change rapidly so there is little value in yearly sampling. If there are similar discharges than it may be possible to use sampling results at one site as representative or other sites."

#### Response

Comment noted. See response to comments E-8 and E-9. The economic impact statement assumed monitoring events would be once or twice per a 5-year cycle.



**Eric Johnson**

General Comments

Comment

**E-11.** "Our Association is pleased to see a substantial amount of effort going into the economic analysis of the sediment management standards. It is unfortunate that the transmittal letter for the document did not indicate that comments on the analysis would be accepted, or what date they were due. This may have decreased the number of comments on this important document."

Response

Comment noted. While the comment deadline for the economic analysis was noted in the Focus sheet distributed with the draft rule, it was inadvertently omitted from the economic document transmittal letter.

Comment

**E-12.** "Our first general comment on the document is that it badly needs a concise Executive Summary. This summary must include clear tables which provide the numerical information contained in the report. This type of analysis lends itself well to tabular summary format. The summary cost tables should also list the factors that are being explicitly left out of the cost analysis, such as compliance with AKART, collection of site-specific SIZ information, etc."

Response

Ecology believes that adequate summary information is provided in the Economic Compliance Document and that an executive summary is not needed.

Comment

**E-13.** "The document also must give all costs in units of \$/time. It is unclear in many instances if the reported costs are annual, or for a five-year permit cycle. Costs should probably be consistently reported in an 'annual' format."

Response

Comment noted. Clarifications were added to the text where necessary.

Comment

**E-14.** "A final general comment is that there must be a list of references. As the document is now written, the reader is unable to check for the sources of the information contained in the report."

Response

A list of references was added to the report.

**Daniel D. Syrdal**

Comment

**E-15.** "Finally, we believe the potential economic impact of these regulations has been seriously understated in the Economic Impacts Analysis. Perhaps its greatest flaw in this regard is the failure to analyze the impact to municipalities when storm water discharges become subject to permitting. Costs related to permitting a sediment impact zone are greatly underestimated especially when multiple sources and possible load allocation is considered. Just the information that would have to be gathered in many cases to run the models could far exceed the estimates. These large costs are part of the reason the Department should seriously consider changing the threshold levels for considering sediment issues."

Response

In Part II, Section 2.3 of the Economic Impact Statement, it was noted that costs were based on a single NPDES discharge, and that additional costs will likely be incurred when other municipal discharges such as storm drains are permitted. The proposed rule does not specify strict data requirements, rather it presents a flexible decision making and data gathering process that takes into account efficiency and cost, and encourages maximizing the use of existing data. In addition, the rule provides an exemption to SIZmax requirements for some municipal stormwater discharges.

**Richard Ford**

Comment

**E-16.** "As the DEIS and draft economic impact statement confirm, it would have significant economic impacts on port and water-related businesses, and municipalities responsible for wastewater treatment and disposal. This impact is made even greater by the cumulative economic effects of other proposed or recently

promulgated environmental regulations whose effects were not considered in the DEIS."

Response

Comment noted. The purpose of the economic impact statement is to evaluate the incremental economic impacts of the proposed rule and not the cumulative impacts of all environmental regulations.

Comment

**E-17.** "The proposed final rule does not specify the level of monitoring that would be required under different circumstances.... "The projected costs of establishing and maintaining a sediment impact zone are substantial, ranging from approximately \$127,000 to \$252,000 for a 5-year permit.... For municipal dischargers that have multiple discharge outfalls, monitoring costs could be significantly higher."

Response

Please see Ecology's response to comment E-8.

Comment

**E-18.** "The DEIS (and Economic Impact Statement) do not address the cumulative economic effects of other proposed or recently promulgated environmental regulations. See DEIS 5-12 to 5-13. The final EIS (and Economic Impact Statement) should include an analysis of cumulative economic effects since, although the costs for complying with the Sediment Management Standards may not drive a business into bankruptcy, the collective costs of complying with the Sediment Management Standards and other proposed or recently promulgated environmental regulations may drive a business into bankruptcy."

Response

Comment noted. The purpose of the economic impacts statement is to evaluate the incremental economic impacts of the proposed rule and not the cumulative impacts of all environmental regulations.

**Small Business Economic Impacts**

Comment

**E-19.** "Obviously, a great deal of effort has gone into this analysis, and both the Department of Ecology and the contractors deserve commendation for this effort. The analysis of businesses

by SIC code, in particular, is most interesting and useful."

Response

Comment noted.

Comment

**E-20.** "It seems intuitively incorrect, however, to assume upfront that there will be no costs of attaining AKART as a result of the sediment management process.... If there will be no AKART impact, what is the effect of the program?... The document should contain some detailed discussion of sediment treatment technologies, and what they cost to install and operate."

Response

The costs of attaining AKART are not included in the analysis because businesses will incur these costs by complying with other laws and regulations. It was beyond the scope of this document to evaluate the cost of achieving AKART (e.g., costs of effluent treatment technologies).

Comment

**E-21.** "Finally, each of the economic mitigation methods described in chapter 5 of the Small Business Economic Impact Statement should be referenced fairly directly in the rule itself. ... "For example, the economic mitigation detailed in chapter 5, part five, does not immediately flow from the wording of WAC 173-204-560 (2). If flexibility is to be factored in at this stage (as it should), the rule must more clearly state it. "This same line of thought applies to section 400 (5) of the rule, where no mention of economic tradeoffs guides the reader to the conclusion that this section can be a factor in choosing the scope of the monitoring plan. These economic values should be explicitly mentioned."

Response

The rule has been revised to incorporate consideration of cost in establishing the scope of source control monitoring and cleanup studies.

**Economic Impact Analysis**

Comment

**E-22.** "Our primary initial comment is that the analysis of the

cost impacts of the rule on the Puget Sound ports includes costs associated with discharges and with dredging, but it ignores the potentially significant costs which ports can face as landowners of contaminated aquatic property. "The analysis should directly address the costs to the public at large of cleaning up aquatic lands owned or managed by public entities such as the state, ports, cities, etc."

#### Response

Costs of contaminated sediment cleanup that may be experienced by ports are addressed in Part II, Section 4 of the Economic Impact Statement. The potential for the costs to be born by the public at large, through increased service fees, is addressed in Part II, Section 1.2 of the economic document.

#### Comment

**E-23.** "In addition, the statement in the introduction that 'the costs to state agencies are addressed by the state budget, and therefore not to be evaluated in this report' must be re-thought by the contractors. ... It is not good public policy to dismiss costs to the taxpayers of the State on the grounds that these costs are 'addressed by appropriations from the state budget'. 'Finally, in the section dealing with costs to port districts (not port 'authorities'), the analysis must mention that these ports each face the likelihood of being impacted by several cleanup sites each. Costs should be evaluated from this perspective. '.... I suggest that if costs are annualized, a more typical market rate be used for calculating interest.'"

#### Response

Costs incurred by state agencies will have to be accommodated through existing budgets, enhanced revenues, or additional appropriations from the state budget process. These costs are most likely to be transferred to the general public in the form of a reduction in services or higher user fees. The term "port authorities" was changed to "port districts" throughout the document. In Part II, Section 4 of the Economic Impact Statement, it was acknowledged that some ports may incur costs at more than one site. A discount rate of 3 percent is generally accepted for discounting for government entities; use of a different discount rate would affect the absolute magnitude, but not the relative magnitude of the cost estimates.

#### Comment

**E-24.** "There has also been some concern among the affected ports at the apparent misunderstanding by the contractors of the uses to which the ports put the revenues which they generate. At the Port of Everett, for example, the current cash reserves mentioned in the economic analysis are the results of a large real estate deal between the port and the U.S. Navy for homeport property. The port is obligated to the citizens of its district to spend these monies re-creating the land base and capital facilities which it sold to the Navy. It is not really proper to consider these cash reserves when accounting for the costs of cleanups in Port Gardner Bay. "This general comment regarding the uses to which most port revenues are put also applies to the analysis for the Port of Seattle and the Port of Tacoma."

Response

In Part II Section 4, it has been acknowledged that ports are publicly accountable entities and have reserve funds earmarked for improvement or maintenance projects and that use of these funds for cleanup may affect a port's ability to provide (or improve) its services.

**George Ploudre**

Comment

**E-25.** "Price level used in the analysis should be specified."

Response

Cost assumptions for major activities required for compliance with sediment impact zones and the cleanup decision process were based on the references cited in the report, and on the best professional judgement and direct experience of report authors. These costs are provided in Appendix B to the Economic Impact Statement. Unit costs for major activities (e.g., dredging, capping) are already provided in footnotes within the text.

Comment

**E-26.** "Impact analysis should more fully address effects on ports and marine industry. Analysis presumes that clean-up costs can be amortized over a 20 year period. What if costs have to be financed over a much shorter period e.g. 5 or 10 years?"

Response

Amortization of costs over a 5 or 10 year period would not alter the relative impacts described in the report, rather it would

require a greater expenditure of funds over a shorter period of time. This may increase impacts to ports if long-term cash reserves are more secure than short-term cash reserves.

Comment

**E-26.** "Why would a port authority be liable for cleanup of sediment in maintaining a navigation channel? Is there a similar requirement of the general public and Federal Government to do the same? Would these be a WAC-induced dredging cleanup requirement to a proposed dredging plan and who would pay these additional costs? Why would the dredgers be required to pay these costs if original polluter isn't?"

Response

A port would assume responsibility for cleanup requirements to the extent they are either the landowner or the party responsible for the contamination. They may also bear cleanup responsibilities in cases where maintenance dredging requires disturbing contaminated sediments that otherwise might not be disturbed. However, liability would not necessarily be limited to the dredging proponent. Cost recovery may be pursued with several potentially liable parties. Therefore, the cost analysis may overestimate the impact on port districts to the extent that costs for cleanup actions can be shared among potentially liable parties. Similar liabilities may exist for other dredgers.

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